

NOTICES OF PROPOSED RULEMAKING

Unless exempted by A.R.S. § 41-1995, each agency shall begin the rulemaking process by 1st filing a Notice of Proposed Rulemaking, containing the preamble and the full text of the rules, with the Secretary of State's Office. The Secretary of State shall publish the notice along with the Preamble and the full text in the next available issue of the Arizona Administrative Register.

Under the Administrative Procedure Act (A.R.S. § 41-1001 et seq.), an agency must allow at least 30 days to elapse after the publication of the Notice of Proposed Rulemaking in the Register before beginning any proceedings for adoption, amendment, or repeal of any rule. A.R.S. §§ 41-1013 and 41-1022.

NOTICE OF PROPOSED RULEMAKING

TITLE 4. PROFESSIONS AND OCCUPATIONS

CHAPTER 7. BOARD OF CHIROPRACTIC EXAMINERS

PREAMBLE

1. **Sections Affected**

<u>Sections Affected</u>	<u>Rulemaking Action</u>
R4-7-101	Amend
R4-7-801	New Section
R4-7-802	New Section
R4-7-803	New Section
R4-7-902	New Section
2. **The statutory authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):**

Authorizing statute: A.R.S. § 32-904(B)(2)

Implementing statutes: A.R.S. § 32-931(B), 32-924(A)(5), and 41-1072
3. **The name and address of agency personnel with whom persons may communicate regarding the rulemaking:**

Name:	Patrice A. Pritzl, Executive Director
Address:	Board of Chiropractic Examiners 5060 North 19th Avenue, Suite 416 Phoenix, Arizona 85015-3210
Telephone:	(602) 255-1444
Fax:	(602) 255-4289
4. **An explanation of the rule, including the agency's reasons for initiating the rule:**

R4-7-101 will amend the list of definitions to include "business day".

R4-7-801, R4-7-802, and R4-7-803 will define continuing education required by A.R.S. § 32-931. These are the continuing education requirements necessary for license renewal on an annual basis. In addition, the proposed rule will provide the public with information on minimum continuing education requirements.

R4-7-902 will clearly define the statutory term "unprofessional and dishonorable conduct" that occurs in the list of actions for which a chiropractic physician's license may be sanctioned under A.R.S. § 32-924.

R4-7-502, R4-7-503, and R4-7-504 will not be included in this Notice of Proposed Rulemaking at this time, but will be published in a separate Notice of Proposed Rulemaking at a later date.
5. **A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision of this state:**

Not applicable.
6. **The preliminary summary of the economic, small business, and consumer impact:**

The economic, small business, and consumer impact statement for the state of Arizona, State Board of Chiropractic Examiners, analyzes the costs, savings, and benefits that accrue to the Board of Chiropractic Examiners, Secretary of State, Board-licensed individuals, and the consumer public.

R4-7-101 will define "business day". There is no anticipated cost to licensees or the consumer public. The preliminary summary of the economic, small business, and consumer impact of R4-7-502, R4-7-503, and R4-7-504 will be defined in a separate Notice of Proposed Rulemaking to be published at a later date.

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R4-7-801, R4-7-802, R4-7-803 - The impact of the proposed rules on established Board procedures, compliance, and inspection costs is minimal. The Board is anticipated to experience a minor increase in investigation and compliance because these rules define continuing education requirements for license issuance and renewal. The estimated cost to the Secretary of State is minimal and stems from the Secretary of State's staff time publishing rules. The estimated cost to licensees is \$200 per year for tuition or registration fees. The consumer public will benefit from this rule through access to providers who maintain continuing education standards within the profession. Licensees will benefit in that enhanced and regulated standards within the profession encourages consumer utilization of services.

R4-7-902 - The impact of this proposed rule, on established Board procedures, compliance, and investigation related costs is minimal. The rule will define unprofessional conduct, thus allowing the Board to more clearly define and better utilize investigative and compliance proceedings. The estimated additional cost to the Secretary of State's Office is minimal and stems from Secretary of State's staff time publishing rules. There are no anticipated costs to licensees or the consumer public. The consumer public will benefit through standards clearly defined for the consumer public as well as the profession. Licensees will benefit in that defined and regulated standards within the profession enhance consumer confidence and encourage consumer utilization of services.

7. The name and address of agency personnel with whom persons may communicate regarding the accuracy of the economic, small business, and consumer impact statement:

Name: Patrice A. Pritzl, Executive Director
Address: Board of Chiropractic Examiners
5060 North 19th Avenue, Suite 416
Phoenix, Arizona 85015-3210
Telephone: (602) 255-1444
Fax: (602) 255-4289

8. The time, place, and nature of the proceedings for the adoption, amendment, or repeal of the rule:

An oral proceeding on the proposed rulemaking is scheduled as follows:

Date: February 20, 1997

Time: 8 a.m. to 10 a.m.

Location: Board of Chiropractic Examiners
5060 North 19th Avenue, Suite 416
Phoenix, Arizona 85015

Nature: An oral proceeding to receive oral and written comments. Written comments may be submitted anytime on or before 5 p.m. on February 20, 1997, to the contact person listed above.

9. Any other matters prescribed by statute that are applicable to the specific agency or to any specific rule or class of rules:
Not applicable.

10. Incorporation by reference and their location in the rules:
None.

11. The full text of the rules follows:

TITLE 4. PROFESSIONS AND OCCUPATIONS

CHAPTER 7. BOARD OF CHIROPRACTIC EXAMINERS

ARTICLE 1. BOARD OF CHIROPRACTIC EXAMINERS

Section
R4-7-101. Definitions

ARTICLE 8. CONTINUING EDUCATION

Section
R4-7-801. Continuing Education Requirements
R4-7-802. Documenting Compliance with Continuing Education Requirements
R4-7-803. Effect of Suspension on Continuing Education Requirements

ARTICLE 9. UNPROFESSIONAL CONDUCT

Section
R4-7-902. Unprofessional or Dishonorable Conduct Activities

ARTICLE 1. BOARD OF CHIROPRACTIC EXAMINERS

R4-7-101. Definitions
No change.

1. No change.
2. No change.
3. No change.
4. No change.
5. No change.
6. No change.
7. No change.
8. No change.
9. "Business day" means Monday through Friday, 8 a.m. to 5 p.m. except for state recognized holidays.

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ARTICLE 8. CONTINUING EDUCATION

R4-7-801. Continuing Education Requirements

- A. To be eligible to renew a license, a licensee shall complete 12 credits of continuing education between January 1 and December 31 of each year. A credit of continuing education shall be defined as 60 minutes of education.
- B. A licensee shall obtain continuing education credit in the following manner:
1. By attending or participating in a course, seminar, or workshop on subjects listed in A.R.S. §§ 32-922(B) or 32-922.02 that are taught at or sponsored by a Council on Chiropractic Education accredited chiropractic college or accredited college or university in the United States pursuant to A.R.S. § 32-931(B).
 2. By teaching a post-graduate course as a faculty member of a Council in Chiropractic Education-accredited college. Continuing education credits earned in this manner shall be calculated as 2 credits of continuing education for each hour of post-graduate course instruction for the 1st course presentation and 1 credit for each hour of instruction thereafter. A maximum of 6 credits of continuing education credit may be obtained in this manner annually.
- C. The Board shall award continuing education credit only for the subjects listed in A.R.S. §§ 32-922(B) or 32-922.02.
- D. The Board may grant an extension of 90 days to comply with the continuing education requirements. To qualify for an extension, a licensee shall:
1. Timely file a license renewal application and renewal fee; and
 2. Submit a written request for an extension, including good cause why the continuing education requirements were not met.
- E. The following reasons may constitute good cause for the Board to grant an extension of time to comply with the Continuing education requirements.
1. The licensee graduated from an accredited chiropractic college, or a college that meets the requirements of R4-7-702, during the year that the continuing education requirements were to be met;
 2. The licensee lived in a country where there was no accredited chiropractic college, or a college that meets the requirements of R4-7-702, for at least 7 months during the year the continuing education requirements were to be met;
 3. The licensee was in active military service for at least 7 months during the year that the continuing education requirements were to be met; or
 4. The licensee was not able to complete the continuing education requirements because of a documented disability of the licensee's spouse, child, or parent.
- F. If the Board grants an extension of time in which to complete the continuing education requirements, the continuing education credits obtained during the 90-day extension shall be applied to meet only the requirements for which the extension was granted. A licensee shall not report continuing education credit earned during a 90-day extension for a subsequent renewal year.

R4-7-802. Documenting Compliance with Continuing Education Requirements

- A. A licensee shall retain documents to verify compliance with the continuing education requirements for at least 5 years from the date the continuing education credit is used to qualify the licensee for renewal.

- B. With each licensee renewal application, a licensee shall attest by providing the licensee's notarized signature, that the licensee has met the continuing education requirements, and will comply with subsection (A).
- C. The Board may require a licensee to provide documentation to verify compliance with continuing education requirements, including that:
1. Each continuing education credit was for 60 minutes of education;
 2. The requirements of subsections (A) and (B) were satisfied;
 3. Continuing education credit was earned between the immediately preceding January 1 and the date that the license renewal application was filed; and
 4. No continuing education credit earned between the immediately preceding January 1 and the date that the license renewal application was filed was earned under an extension of time to comply with the continuing education requirements of a previous year.

R4-7-803. Effect of Suspension on Continuing Education Requirements

A licensee is suspended under A.R.S. §§ 32-923, 32-924, or 32-931, shall complete 12 credits of continuing education for each calendar year or part of a calendar year that the license is suspended before the license may be reinstated or renewed.

ARTICLE 9. UNPROFESSIONAL CONDUCT

R4-7-902. Unprofessional or Dishonorable Conduct Activities

- A. Unprofessional or dishonorable conduct, as used in A.R.S. § 32-924(B)(5), means:
1. Referring a patient to a diagnostic or treatment facility or prescribing goods and services to be purchased from a facility in which the chiropractic physician has any pecuniary interest, without disclosing in writing to the patient and any 3rd-party payor, the chiropractic physician's interest.
 2. Knowingly making a false or misleading statement to the Board, its investigators or representatives, a patient, or a 3rd-party payor.
 3. Failing to create and maintain a patient record that includes the patient's health history, examination findings, diagnostic results, x-ray films if taken, x-ray reports, treatment plan, and notes for each patient visit. The notes for each patient visit shall include the date the patient was seen, the chiropractic physician's findings, all services rendered, and name or initials of the chiropractic physician who saw the patient and provided services.
 4. Failing to maintain a patient's record, including x-rays, for at least 5 years after the last treatment date, or failing to provide written notice to the Board about how to access the patient records of a chiropractic practice that is closed, for at least 5 years after each patient's last treatment date.
 5. Failing to release a copy of a patient record, diagnostic quality radiographic copy x-rays, or both, to another licensed physician, the patient, or the authorized agent of the patient, within 10 working days of receiving a written request to do so, or failing to return original x-rays to a licensed physician within 10 working days of a written request to do so.
 6. Representing that the licensee is certified by this Board in a specialty area in which the licensee is not certified, or has academic or professional credentials that the licensee does not have.

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7. Practicing under, or billing for services under, any name other than the name by which the chiropractic physician is licensed, including corporate, business, or other licensed health care providers' names, without 1st notifying the Board in writing.
8. Suggesting or having sexual contact as defined in A.R.S. § 31-1401 with an individual in the course of patient treatment, or intentionally viewing a completely or partially disrobed patient in the course of treatment, when viewing a completely or partially disrobed patient is not necessary to the treatment according to the generally accepted professional standards of chiropractic.
9. Charging a fee for services not rendered.
10. Paying, offering to pay, receiving or agreeing to receive, a commission, rebate, or other consideration having a value exceeding \$25.00 annually, directly or indirectly, to attorneys or other licensed health care providers, for referring patients.
11. Failing or allowing properly authorized Board personnel to have, on demand, access to any documents, reports, or records maintained by the chiropractic physician relating to the chiropractic physician's practice or professional activities.
12. Failing to supervise properly a chiropractic assistant employed by the chiropractic physician.
13. Failing to report in writing to the Board any information based upon personal knowledge, that a chiropractic physician may be grossly incompetent, guilty of unprofessional or dishonorable conduct, or mentally or physically unable to provide chiropractic services safely.
14. Violating any federal or state laws or rules and regulations applicable to the practice of chiropractic.

NOTICE OF PROPOSED RULEMAKING

TITLE 12. NATURAL RESOURCES

CHAPTER 1. RADIATION REGULATORY AGENCY

PREAMBLE

1. Sections Affected	Rulemaking Action
R12-1-101	Amend
R12-1-102	Amend
R12-1-103	Amend
R12-1-202	Amend
R12-1-204	Amend
R12-1-418	Amend
R12-1-419	Amend
R12-1-438	Amend
R12-1-448	New Section
R12-1-506	Amend
R12-1-511	New Section
R12-1-521	Amend
R12-1-523	Amend
R12-1-541	Amend
R12-1-605	Amend
R12-1-610	Amend
R12-1-614	Amend
R12-1-901	Amend
R12-1-902	Amend
R12-1-903	Amend
R12-1-907	Amend
R12-1-909	Amend
R12-1-912	Amend
Article 11	Repeal
R12-1-1101	Repeal
R12-1-1102	Repeal
R12-1-1103	Repeal
R12-1-1104	Repeal
R12-1-1302	Amend
R12-1-1306	Amend
R12-1-1502	Amend
R12-1-1503	Repeal
R12-1-1504	Amend
R12-1-1505	Amend
R12-1-1506	Amend
R12-1-1507	Amend
R12-1-1508	Amend
Appendix A	Repeal
R12-1-1715	Amend

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R12-1-1716	Amend
R12-1-1721	Amend
R12-1-1723	Amend
R12-1-1742	Amend
R12-1-1743	Amend
R12-1-1751	Amend

2. The statutory authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):

Authorizing statute: A.R.S. § 30-654(B)

Implementing statutes: A.R.S. § 30-656, 30-657(A), 30-672, 30-681, 30-683, and 30-696

3. The name and address of agency personnel with whom persons may communicate regarding the rulemaking:

Name: Dan Kuhl
Address: Radiation Regulatory Agency
4814 South 40th Street
Phoenix, Arizona 85040
Telephone: (602) 255-4845, ext. 233
Fax: (602) 437-0705

4. An explanation of the rule, including the agency's reasons for initiating the rule:

- R12-1-101 Changes are made to modernize the wording and an incorporation is updated.
- R12-1-102 Incorporations by references and wording are updated. Definitions for "certifiable cabinet x-ray system" and "certified cabinet x-ray system" are added so industrial x-ray systems that have been modified to meet safety standards will be treated as if they are certified. The definition of "NORM" is now contrasted with "NARM" in the definition of "NARM." The definition for "nuclear waste" is moved from Article 15, where it was buried in R12-1-1508, to the list of definitions in this Article for ease of reference and consistency reasons. The definition of "Radiation Safety Officer" is modified to include references to the registrant in response to its use in Article 9. This change will clarify the requirements in Article 9, and was initiated as part of a recently completed Five-year-review.
- R12-1-103 "Sources of radiation" is replaced with "Radioactive material" because 49 CFR only regulated radioactive material. An incorporation by reference is added.
- R12-1-202. The requirement to submit an x-ray facility description is listed in conjunction with the requested facility description already requested on the application forms in Appendix A of this Article. The requirements will continue to be a condition of application acceptability. Also, wording is modernized.
- R12-1-418 and R12-1-419. The 1st rule requires that a personnel monitoring device issued to an individual be used only by that individual. This additional requirement is made to insure there is no confusion as to who actually receives a radiation exposure recorded while sharing a personnel monitoring device. The 2nd rule is incorrectly structured making it incompatible with references made to it in other rules emphasizing the need for personnel monitoring. This corrects and clarifies the rule.
- R12-1-438. An incorrect rule reference is made. Records of waste disposal shall be maintained in accordance with R12-1-441 rather than R12-1-407.
- R12-1-448. The Nuclear Regulatory Commission is requiring the Agency adopt event reporting requirements involving specified quantities of radioactive materials as part of Arizona's agreement to maintain a radiation safety program.
- R12-1-506. A requirement in this rule is clarified by replacing the nonspecific use of the word "quantity" with a phrase that specifies the radioactivity of each radioactive source. Additionally, the person performing the required inventory will be required to sign the report of inventory so that recordkeeping can be better monitored by the licensee's management and the Agency. A number of improvements are made in the wording.
- R12-1-511. Licensing requirements specific to industrial radiography are placed in Article 5 where all of the radiography requirements are listed. They are a duplication of existing requirements in Article 3 that will be removed at a later date. The remaining requirements in Article 3 will then be general in nature and not specific to any specialized use. Maintaining all of the specific requirements in 1 Article should assist the radiography user in meeting all of the specific radiation safety requirements associated with the practice of radiography. Wording changes are made as necessary to improve understandability.
- R12-1-521. Changes are made to correctly reference the radiography licensing requirements that are now located in R12-1-511 and improve wording.
- R12-1-523. A reference to R12-1-419 is added to better describe the maintenance of personnel monitoring records.
- R12-1-541. Certifiable enclosed radiography machines will be exempted from the requirements in Article 5 because they have been modified to meet the safety standards of the certified enclosed radiography machines.

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- R12-1-605. Table 1 organization is amended to correct errors made during printing.
- R12-1-610. "Intraoral" is added to the Section heading for clarification.
- R12-1-614. The accepted mesh site, used to evaluate film-screen contact in the making of mammography x-ray images, is changed to 40 as is currently accepted by the American College of Radiology.
- R12-1-901 through R12-1-912. The majority of revisions are made to the rules contained in Article 9 as a result of the last 5-year review. Most of the changes are needed as a direct result of changes made to Article 4. Requirements are frequently referenced in this Article. Also grammatical and word changes are made to improve readability. In R12-1-909, the requirement for a flashing warning light in medical facilities is deleted because some medical conditions may be aggravated by it.
- Article 11 This Article is repealed because the regulatory authority over mill tailings was returned to the Nuclear Regulatory Commission in 1980.
- R12-1-1302. This rule is modified to correct an outdated incorporated reference and correct 2 rules referenced in Article 4. The definition for Category D17 is deleted because the requirement for a license is unnecessary because waste disposal is addressed in existing Article 3 licensing requirements.
- R12-1-1306. Through no fault of the Agency, the "Type A" class for "Category B2" was omitted during the last publication of Article 13. It is added at this time to correct this error. Category D11 is now given a dollar value of \$3,000,000 rather than a "full cost" listing. Based on the cost experience gained from this type of licensing operation recently completed in California, it is believed this is a realistic cost for developing a license for a low-level radioactive waste site. The final change to this rule removes the D17 category which is being removed with the deletion of the definition of D17 from R12-1-103; the removal of the definition is described above.
- R12-1-1502. Terms defined here are moved to Article 1 where a definition list is maintained in R12-1-102. A reference to the list is provided and a word correction is made.
- R12-1-1503. This rule is repealed because the exemption in subsection (A) is already addressed in R12-1-103, while the exemption in subsection (C) is being moved to R12-1-103 as well. Subsection (B) is removed as an exemption because specific precautions are addressed in R12-1-1506 and other precautions for receipt of certain packages are specified in R12-1-433. These new requirements must be followed when receiving packages.
- R12-1-1504, R12-1-1505, and R12-1-1506. A portion of R12-1-1504(A)(2) is deleted because the exemption granted to a private carrier is in fact the same exemption extended to them in subsection (A)(1). In that subsection a private carrier is referred to as a licensee. All 3 rules are modified to correct outdated incorporated by references and improve wording.
- R12-1-1507. The exemption in subsection (A) is deleted because the date limiting the exemption has passed. Subsection (B) is modified to clarify quality assurance requirements.
- R12-1-1508. The definition of nuclear waste in subsection (A) is moved to the definition list in R12-1-102. An incorporated reference is updated. Appendix A is deleted because the special form test requirements are already contained in the incorporated reference.
- R12-1-1715 through R12-1-1751. Revisions are made to rules contained in Article 17 as a result of the last 5-year review. Changes include the revision of references to requirements in Article 4, as a result of recent changes to Article 4; a change of frequency for radioactive material inventory from quarterly to every 6 months, which is the current frequency in the regulatory community; the length of time personnel monitoring records must be maintained, which will now be less lengthy; the requirement to maintain inventory records at field stations is modified to remain consistent with the changes to R12-1-1716; the requirement to have a copy of the current Arizona Radioactive Material License at the temporary job site; and the requirement to notify the Agency before initiating a plan to recover a source lost down-hole. A copy of the radioactive material license shall be maintained at a job site, which will facilitate Agency inspection. Also some changes are made to improve readability.
- The Agency notification of planned retrieval will help insure that proper procedure is used and diminish the chance of the spread of radioactive contamination from a damaged source.

5. A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision of this state:
Not applicable

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6. The preliminary summary of the economic, small business, and consumer impact:

Notification of Incidents:

Addition of R12-1-448 to Article 4 is in response to the NRC determining the reporting requirements contained in 10 CFR 20 and equivalent requirements in Article 4 would be cumbersome and difficult to develop and use. The rule will help minimize reports of significant events, using a set of activity thresholds for determining when fire and explosions, and contamination events are reportable. The new thresholds, requiring notification at 5 times the lowest annual limit on intake specified in Appendix B of Article 4, will help to minimize unnecessary reporting and minimize the economic impact to all affected parties. There should be little economic impact to all parties involved.

Disposal site licensing fee:

A \$3,000,000 licensing fee is proposed for a Low-level Radioactive Waste Disposal Site license. The associated fee is being justified using an existing site recently licensed in California.

Other Changes and Additions

Other changes and additions are made to improve clarity, consistency, and understanding of the rules. In Article 5 requirements are added from Article 3 to better organize and portray the requirements. In Article 2 facility requirements are stated in rule that have only been required on the application form in the past. The majority of changes are made as a result of five-year reviews, which are an on-going process in keeping the rules and wording of the rules current. The economic impact to all affected parties should be minimal.

7. The name and address of agency personnel with whom persons may communicate regarding the accuracy of the economic, small business, and consumer impact statement:

Name: Dan Kuhl
Address: Radiation Regulatory Agency
4814 South 40th Street
Phoenix, Arizona 85040
Telephone: (602) 255-4845, ext. 233
Fax: (602) 437-0705

8. The time, place, and nature of the proceedings for the adoption, amendment, or repeal of the rule:

An oral proceeding is scheduled for February 10, 1997, at 1:30 p.m. at the address listed below. A person may submit written comments concerning the proposed rules by submitting them no later than 5 p.m., February 10, 1996, to the following person:

Name: Aubrey Godwin, Director
Address: Radiation Regulatory Agency
4814 South 40th Street
Phoenix, Arizona 85040
Telephone: (602) 255-4845
Fax: (602) 437-0705

9. Any other matters prescribed by statute that are applicable to the specific agency or to any specific rule or class of rules:
Not applicable.

10. Incorporation by reference and their location in the rules:

10 CFR 150, R12-1-101(C)
10 CFR 71, R12-1-102(1)
21 CFR 1010.2, R12-1-102(23)
21 CFR 1020.40, R12-1-102(22) and (23)
40 CFR 190 and 191, R12-1-102(54)
10 CFR 71.4, R12-1-102(83)
49 CFR 173.403, R12-1-102
49 CFR 100 through 109, R12-1-102(123)
10 CFR 71, R12-1-102(139)(c)
49 CFR Parts (many), R12-1-103(A)
30 CFR 111.1, R12-1-103(A)
10 CFR 61, R12-1-1302(D)(11)
49 CFR 171 through 189, R12-1-1504(B)
49 CFR 177.848, R12-1-1505(B)
49 CFR 171 through 189, R12-1-1506(1)
10 CFR 71, R12-1-1507(A)
49 CFR 172.202 and 172.203(d), R12-1-1508(B)(2)

11. The full text of the rules follows:

TITLE 12. NATURAL RESOURCES

CHAPTER 1. RADIATION REGULATORY AGENCY

ARTICLE 1. GENERAL PROVISIONS

Section	
R12-1-101.	Scope
R12-1-102.	Definitions
R12-1-103.	Exemptions

ARTICLE 2. REGISTRATION AND CERTIFICATION OF
IONIZING RADIATION MACHINE FACILITIES,
REGISTRATION OF SERVICES, AND LICENSING OF
NONIONIZING RADIATION MACHINE FACILITIES

Section	
R12-1-202.	Application Requirements for Registration or Certification of Radiation Machines; Ionizing and Non-ionizing Radiation Machine Facilities; Notification
R12-1-204.	Issuance of Notice of Registration

ARTICLE 4. STANDARDS FOR PROTECTION AGAINST
IONIZING RADIATION

Section	
R12-1-418.	Surveys and Monitoring
R12-1-419.	Conditions Requiring Individual Monitoring of External and Internal Occupational Dose
R12-1-438.	Disposal of Specific Wastes
R12-1-448.	Additional Reporting Requirements

ARTICLE 5. RADIATION SAFETY REQUIREMENTS FOR
INDUSTRIAL RADIOGRAPHIC OPERATIONS

Section	
R12-1-506.	Quarterly inventory
R12-1-511.	License Application Requirements for Industrial Radiography
R12-1-521.	Requirements for Radiographers and Radiographer's Assistants
R12-1-523.	Personnel Monitoring Control
R12-1-541.	Enclosed Radiography Using X-ray Machines

ARTICLE 6. USE OF X-RAYS IN THE HEALING ARTS

Section	
R12-1-605.	General Equipment Requirements
R12-1-610.	Dental Intraoral Radiographic Systems
R12-1-614.	Mammographic Systems

ARTICLE 9. RADIATION SAFETY REQUIREMENTS FOR
PARTICLE ACCELERATORS

Section	
R12-1-901.	Purpose and Scope
R12-1-902.	Registration Requirements
R12-1-903.	General Requirements for the Issuance of a Registration for Particle Accelerators
R12-1-907.	Shielding and Safety Design Requirements
R12-1-909.	Warning Devices
R12-1-912.	Ventilation Systems

ARTICLE 11. RADIATION SAFETY REQUIREMENTS
FOR URANIUM AND THORIUM MILL TAILINGS

Section	
R12-1-1101.	Scope
R12-1-1102.	Maintenance of piles and ponds at all mills
R12-1-1103.	Additional requirements for inactive mills
R12-1-1104.	Waiver

ARTICLE 13. LICENSE AND REGISTRATION FEES

Section	
R12-1-1302.	Types of Licenses and Registrations
R12-1-1306.	Schedule of Fees

ARTICLE 15. TRANSPORTATION

Section	
R12-1-1502.	Definitions
R12-1-1503.	Exemptions Reserved
R12-1-1504.	Intrastate Transportation and Storage of Retroactive Materials
R12-1-1505.	Storing of Radioactive Material in Transport
R12-1-1506.	Preparation of radioactive material for transport
R12-1-1507.	Packaging Quality Assurance
R12-1-1508.	Advance Notification of Transport of Nuclear Waste
Appendix A	Tests for Special Form Radioactive Material

ARTICLE 17. RADIATION SAFETY REQUIREMENTS
FOR WIRELINE SERVICE OPERATIONS AND
SUBSURFACE TRACER STUDIES

Section	
R12-1-1715.	Leak Testing of Sealed Sources
R12-1-1716.	Quarterly inventory Inventory
R12-1-1721.	Training Requirements
R12-1-1723.	Personnel Monitoring
R12-1-1742.	Documents and Records Required at Field Stations
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R12-1-1751.	Notification of Incidents, Abandonment and Lost Sources

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ARTICLE 1. GENERAL PROVISIONS

R12-1-101. Scope

- A. No change.
- B. ~~Nothing in this Chapter shall apply to any person to the extent such person is subject to regulation by the U.S. Nuclear Regulatory Commission. This Chapter does not apply to a person to the extent such person is subject to regulation by the Nuclear Regulatory Commission.~~
- C. ~~State Regulation by the state of source material, by-product material, and special nuclear material in quantities not sufficient to form a critical mass shall be subject to the provisions of the agreement between the state and the U.S. Nuclear Regulatory Commission, signed March 30, 1967, incorporated herein by reference in this rule and on file with the Office of the Secretary of State, and to Part 150 of the Commission's regulations (10 CFR 150), 1993 1996 Edition, published January 1, 1993 1996, by the Office of the Federal Register, National Archives and Records Administration, incorporated herein by reference and on file with the Agency and the Office of the Secretary of State. These incorporations by reference contain no future editions or amendments.~~

R12-1-102. Definitions

Terms defined in A.R.S. § 30-651 have the same meanings when used in this Chapter. The following terms have the definitions set forth below. Additional definitions used only in a certain Article will be found in that Article.

1. "A₁" means the maximum activity of special form radioactive material permitted in a Type A package. "A₂" means the maximum activity of radioactive material, other than special form radioactive material, permitted in a Type A package. These values are either listed in 10 CFR 71, ~~Table I, Appendix A, Appendix A, Table A-1,~~ or may be derived in accordance with the procedure prescribed in 10 CFR 71, Appendix A, 1993 1996 Edition, published January 1, 1993 1996, by the Office of the Federal Register, National Archives and Records Administration, incorporated herein by reference and on file with the Agency and the Office of the Secretary of State. This incorporation by reference contains no future editions or amendments.
2. "Absorbed dose" means the energy imparted by ionizing radiation per unit mass of irradiated material. The units of absorbed dose are the gray (Gy) and the rad.
3. "Accelerator" means any machine capable of accelerating electrons, protons, deuterons, or other charged particles in a vacuum and of discharging the resultant particulate or other radiation into a medium at energies usually in excess of 1 MeV. For purposes of this definition, "particle accelerator" is an equivalent term.
4. "Accelerator produced material" means any material made radioactive by irradiating it in a particle accelerator.
5. "Act" means A.R.S. Title 30, Chapter 4..
6. "Activity" means the rate of disintegration, transformation, or decay of radioactive material. The units of activity are the becquerel (Bq) and the curie (Ci).
7. "Adult" means an individual 18 or more years of age.
8. "Agency", or "ARRA" means the Arizona Radiation Regulatory Agency.
9. "Agreement State" means any state with which the United States Nuclear Regulatory Commission has entered into an effective agreement under Section 274(b) of the Atomic Energy Act of 1954, as amended (73 Stat. 689).
10. "Airborne radioactive material" means any radioactive material dispersed in the air in the form of aerosols, dusts, fumes, mists, vapors, or gases.
11. "Airborne radioactivity area" means a room, enclosure, or area in which airborne radioactive materials, composed wholly or partly of licensed radioactive material, exist in concentrations:
 - a. In excess of the derived air concentrations (DACs) specified in Appendix B, Table I of Article 4 of these rules, or
 - b. That an individual present in the area without respiratory protective equipment could exceed, during the hours an individual is present in a week, an intake of 0.6 percent of the annual limit on intake (ALI) or 12 DAC-hours.
12. "ALARA" means as low as is reasonably achievable, making every reasonable effort to maintain exposures to radiation as far below the dose limits in these rules as is practical, consistent with the purpose for which the licensed or registered activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed or registered sources of radiation in the public interest.
13. "Analytical x-ray equipment" means equipment used for x-ray diffraction or x-ray-induced fluorescence analysis.
14. "Analytical x-ray system" means a group of components utilizing x-rays to determine the elemental composition or to examine the microstructure of materials.
15. "Background radiation" means radiation from cosmic sources; naturally occurring radioactive materials, including radon, except as a decay product of source or special nuclear material less than ten times the quantities listed in Article 4, Appendix B, ~~Table 3~~ Table II; and global fallout as it exists in the environment from the testing of nuclear explosive devices. "Background radiation" does not include sources of radiation from radioactive materials regulated by the Agency.
16. "Becquerel" (Bq) means the International System (SI) unit for activity and is equal to one disintegration per second (dps or tps).
17. "Bioassay" means the determination of kinds, quantities, or concentrations, and in some cases, the locations of radioactive material in the human body, whether by direct measurement, in vivo counting, or by analysis and evaluation of materials excreted or removed from the human body. For purposes of these rules, "radiobioassay" is an equivalent term.
18. "Brachytherapy" means a method of radiation therapy in which an encapsulated source or group of sources is utilized to deliver beta or gamma radiation at a distance of up to a few centimeters, by surface, intracavitary or interstitial application.
19. "By-product material" means:
 - a. Any radioactive material, except special nuclear material, yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material; and
 - b. The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes.

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Underground ore bodies depleted by these solution extraction operations do not constitute "by-product material" within this definition.

20. "Calendar quarter" means not less than 12 consecutive weeks nor more than 14 consecutive weeks. The first calendar quarter of each year shall begin in January and subsequent calendar quarters shall be so arranged such that no day is included in more than one calendar quarter and no day in any one year is omitted from inclusion within a calendar quarter. No licensee or registrant shall change the method observed by him of determining calendar quarters for purposes of this Chapter except at the beginning of a calendar year.
21. "Calibration" means the determination of:
- a. The response or reading of an instrument relative to a series of known radiation values over the range of the instrument or
 - b. The strength of a source of radiation relative to a standard.
- "Certifiable cabinet x-ray system" means an existing un"certified x-ray system that meets or has been modified to meet the certification requirements specified in 21 CFR 1020.40, 1995 Edition, published April 1, 1995, by the Office of Federal Register National Archives and Records Administration, incorporated by reference and on file with the Agency and the Office of the Secretary of State. This incorporation by reference contains no future editions or amendments.
- "Certified cabinet x-ray system" means an x-ray system that has been certified in accordance with 21 CFR 1010.2, as being manufactured and assembled on or after April 10, 1975, in accordance with the provisions of 21 CFR 1020.40, both references 1995 Edition, published April 1, 1995, by the Office of the Federal Register, National Archives and Records Administration, incorporated by reference and on file with the Agency and the Office of the Secretary of State. These incorporations by reference contain no editions or amendments.
22. "CFR" means Code of Federal Regulations.
23. "Chelating agent" means amine polycarboxylic acids, hydroxycarboxylic acids, gluconic acid, and polycarboxylic acids.
24. "Civil penalty" means the monetary fine which may be imposed on licensees by the Agency, pursuant to A.R.S. § 30-687, for violations of the Act, this Chapter, or license conditions.
25. "Collective dose" means the sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation.
26. "Committed dose equivalent" ($H_{T,50}$) means the dose equivalent to organs or tissues of reference (T) that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.
27. "Committed effective dose equivalent" ($H_{E,50}$) is the sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to each of these organs or tissues ($H_{E,50} = \sum w_T H_{T,50}$).
28. "Curie" means a unit of quantity of radioactivity. One curie (Ci) is that quantity of radioactive material which decays at the rate of $3.7E + 10^{10}$ transformations per second (tps).
29. "Current license" or registration means a license or registration issued by the Agency and for which the licensee has paid the license or registration fee for the then current year pursuant to R12-1-1304.

30. "Deep-dose equivalent" (H_d), which applies to external whole body exposure, is the dose equivalent at a tissue depth of one centimeter (1000 mg/cm^2).
31. "Depleted uranium" means the source material uranium in which the isotope uranium-235 is less than 0.711 weight percent of the total uranium present. Depleted uranium does not include special nuclear material.
32. "Dose" is a generic term that means absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, total organ dose equivalent, or total effective dose equivalent. For purposes of these rules, "radiation dose" is an equivalent term.
33. "Dose equivalent (H_T)" means the product of the absorbed dose in tissue, quality factor, and all other necessary modifying factors at the location of interest. The units of dose equivalent are the sievert (Sv) and rem.
34. "Dose limits" means the permissible upper bounds of radiation doses established in accordance with these rules. For purposes of these rules, "limits" is an equivalent term.
35. "Dosimeter" (see "Individual monitoring devices").
36. "Effective dose equivalent (H_E)" means the sum of the products of the dose equivalent to each organ or tissue (H_T) and the weighting factor (w_T) applicable to each of the body organs or tissues that are irradiated ($H_E = \sum w_T H_T$).
37. "Effluent release" means any disposal or release of radioactive material into the ambient atmosphere, soil, or any surface or subsurface body of water.
38. "Embryo/fetus" means the developing human organism from conception until the time of birth.
39. "Enclosed beam x-ray system" means an analytical x-ray system constructed in such a way that access to the interior of the enclosure housing the x-ray source during operation is precluded except through bypassing of interlocks or other safety devices to perform maintenance or servicing.
40. "Enclosed radiography" means industrial radiography conducted by using cabinet radiography or shielded room radiography.
- a. "Cabinet radiography" means industrial radiography conducted by using an x-ray machine in an enclosure not designed for human admittance and which is so shielded that every location on the exterior meets the conditions for an "unrestricted area".
 - b. "Shielded room radiography" means industrial radiography conducted using an x-ray machine in an enclosure designed for human admittance and which is so shielded that every location of the exterior meets the conditions for an "unrestricted area".
41. "Entrance or access point" means any opening through which an individual or extremity of an individual could gain access to radiation areas or to licensed radioactive materials. This includes entry or exit portals of sufficient size to permit human entry, irrespective of their intended use.
42. "Explosive material" means any chemical compound, mixture, or device which produces a substantial instantaneous release of gas and heat spontaneously or by contact with sparks or flame.
43. "Exposure" means:
- a. Being subjected to ionizing radiation or radioactive materials.
 - b. The quotient of dQ by dm where "dQ" is the absolute value of the total charge of the ions of one sign produced in air when all the electrons (negatrons and

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- positrons) liberated by photons in a volume element of air having mass "dm" are completely stopped in air. The special unit of exposure is the roentgen (R).
44. "Exposure rate" means the exposure per unit of time.
45. "External dose" means that portion of the dose equivalent received from any source of radiation outside the body.
46. "Extremity" means hand, elbow, arm below the elbow, foot, knee, and leg below the knee.
47. "Eye dose equivalent" means the external dose equivalent to the lens of the eye at a tissue depth of 0.3 centimeter (300 mg/cm²).
48. "Fail-safe characteristics" means a design feature which causes beam port shutters to close, or otherwise prevents emergence of the primary beam, upon the failure of a safety or warning device.
49. "Field radiography" means industrial radiography, utilizing a portable or mobile x-ray system, which is not conducted in a shielded enclosure.
50. "Field station" means a facility where radioactive sources may be stored or used and from which equipment is dispatched to temporary job sites.
51. "Former U.S. Atomic Energy Commission (AEC) or U.S. Nuclear Regulatory Commission (NRC) licensed facilities" means nuclear reactors, nuclear fuel reprocessing plants, uranium enrichment plants, or critical mass experimental facilities where AEC or NRC licenses have been terminated.
52. "Generally applicable environmental radiation standards" means standards issued by the U.S. Environmental Protection Agency (EPA), 40 CFR 190 and 191, 1992 1995 Edition, published July 1, 1992 1995, by the Office of the Federal Register, National Archives and Records Administration, incorporated ~~herein~~ by reference and on file with the Agency and the Office of the Secretary of State, under the authority of the Atomic Energy Act of 1954, as amended, that impose limits on radiation exposures or levels, or concentrations or quantities of radioactive material, in the general environment outside the boundaries of locations under the control of persons possessing or using radioactive material. This incorporation by reference contains no future editions or amendments.
53. "Gray" (Gy) means the International System (SI) unit of absorbed dose and is equal to one joule per kilogram. One Gray equals 100 rad.
54. "Hazardous waste" means those wastes designated as hazardous in A.R.S. Title 49, § 49-921(5) 49-921(5).
55. "Healing arts" means the practice of medicine, dentistry, osteopathy, podiatry, chiropractic, and veterinary medicine.
56. "Health care institution" means every place, institution, or building which provides facilities for medical services or other health-related services, not including private clinics or offices which do not provide overnight patient care.
57. "High radiation area" means an area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 1 mSv (0.1 rem) in one hour at 30 centimeters from any source of radiation or from any surface that the radiation penetrates.
58. "Human use" means the internal or external administration of radiation or radioactive materials to human beings.
59. "Impound" means to abate a radiological hazard. Actions which may be taken by the Agency in impounding a source of radiation include seizing the source of radiation, controlling access to an area, and preventing a radiation machine from being utilized.
60. "Individual" means any human being.
61. "Individual monitoring" means the assessment of:
- a. Dose equivalent
 - i. By the use of individual monitoring devices or
 - ii. By the use of survey data; or
 - b. Committed effective dose equivalent
 - i. By bioassay or
 - ii. By determination of the time-weighted air concentrations to which an individual has been exposed, that is, DAC-hours.
- (See the definition of DAC-hours in Article 4).
62. "Individual monitoring devices" means devices designed to be worn by a single individual for the assessment of dose equivalent. For purposes of these rules, "dosimeter", "personnel dosimeter", and "personnel monitoring equipment" are equivalent terms. Examples of individual monitoring devices are film badges, thermoluminescent dosimeters (TLDs), pocket ionization chambers, and personal air sampling devices.
63. "Industrial radiography" means the examination of the macroscopic structure of materials by non-destructive methods utilizing sources of ionizing radiation.
64. "Injection tool" means a device used for controlled sub-surface injection of radioactive tracer material.
65. "Inspection" means an examination or observation by a representative of the Agency, including but not limited to tests, surveys, and monitoring to determine compliance with rules, orders, requirements and conditions of the License or certificate of registration.
66. "Interlock" means a device arranged or connected such that the occurrence of an event or condition is required before a second event or condition can occur or continue to occur.
67. "Internal dose" means that portion of the dose equivalent received from radioactive material taken into the body.
68. "Irradiate" means to expose to radiation.
69. "Laser" (light amplification by the stimulated emission of radiation) means any device which can produce or amplify electromagnetic radiation with wave lengths in the range of 180 nanometers to one millimeter primarily by the process of controlled stimulated emission.
70. "License" means the grant of authority, issued pursuant to Article 3 ~~or~~ and 14 of this Chapter and A.R.S. §§ 30-671, 30-672, and 30-721 et seq., to acquire, possess, transfer, and use sources of radiation. The types of licenses issued by the Agency are described in R12-1-1302.
71. "Licensed material" means radioactive material received, possessed, used, transferred, or disposed of under a general or specific license issued by the Agency.
72. "Licensed practitioner" means a person licensed or otherwise authorized by law to practice medicine, dentistry, osteopathy, chiropractic, podiatry or naturopathy in this state.
73. "Licensee" means any person who is licensed by the Agency under this Chapter to acquire, possess, transfer, or use sources of radiation.
74. "Licensing State" means any state having regulations equivalent to this Chapter relating to, and an effective program for the regulation of, naturally occurring and accelerator-produced radioactive material (NARM).
75. "Limits" (See "Dose limits").
76. "Local components" means those parts of an analytical x-ray system that include areas that are struck by x-rays and shall include radiation source housings, port and shutter

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assemblies, collimator, sample holders, cameras, goniometer, detectors and shielding but ~~shall not include including~~ power supplies, transformers, amplifiers, readout devices, and control panels.

77. "Logging supervisor" means the individual who provides personal supervision of the utilization of sources of radiation at the well site.
78. "Logging tool" means a device used subsurface to perform well logging.
79. "Lost or missing licensed or registered source of radiation" means licensed or registered source of radiation the location of which is unknown. Included are licensed radioactive material or a registered radiation source that has been shipped but has not reached its planned destination and whose location cannot be readily traced or ascertained in the transportation system.
80. "Low-level waste" means waste material which contains radioactive nuclides in concentrations or quantities which exceed applicable standards for unrestricted release but does not include:
- High-level waste, such as irradiated reactor fuel, liquid waste from reprocessing irradiated reactor fuel, or solids into which any such liquid waste has been converted;
 - Waste material containing transuranic elements with contamination levels greater than ten nanocuries per gram (370 kilobecquerels per kilogram) of waste material; or
 - The tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content.
81. "Major processor" means a user processing, handling, or manufacturing radioactive material exceeding Type A quantities as unsealed sources or material or exceeding four times Type B quantities as sealed sources but does not include nuclear medicine programs, universities, industrial radiographers, or small industrial programs. Type A and B quantities are defined in 10 CFR 71.4, 1993 1996 Edition, published January 1, 1993 1996, by the Office of the Federal Register, National Archives and Records Administration, incorporated by reference and on file with the Agency and the Office of the Secretary of State. This incorporation by reference contains no future editions or amendments.
82. "Medical dose" means ~~an intentionally delivered a~~ radiation dose ~~intentionally delivered~~ to an individual for medical examination, diagnosis, or treatment.
83. "Member of the public" means any individual except when that individual is receiving an occupational dose.
84. "~~MeV~~ MeV" means Mega Electron Volt which equals one million volts (10^6 eV).
85. "Mineral logging" means any well logging performed in a borehole drilled for the purpose of exploration for minerals other than oil or gas.
86. "Minor" means an individual less than 18 years of age.
87. "Monitoring" means the measurement of radiation, radioactive material concentrations, surface area activities, or quantities of radioactive material, and the use of the results of these measurements to evaluate potential exposures and doses. For purposes of these rules, "radiation monitoring" and "radiation protection monitoring" are equivalent terms.
88. "Multiplier" means a letter representing a number. The use of a multiplier is based on the code given below:

Multiplier		
Prefix	Symbol	Value

eka	E	10^{18}
peta	P	10^{15}
tera	T	10^{12}
giga	G	10^9
mega	M	10^6
kilo	k	10^3
milli	m	10^{-3}
micro	u	10^{-6}
nano	n	10^{-9}
pico	p	10^{-12}
femto	f	10^{-15}
atto	a	10^{-18}

89. "NARM" means any naturally occurring or accelerator-produced radioactive material. It does not include by-product, source, or special nuclear material. This term should not be confused with "Norm" which is defined as naturally occurring radioactive material.
90. "Normal operating procedures" means the entire set of instructions necessary to accomplish the intended use of the source of radiation. These procedures shall include, but are not limited to, sample insertion and manipulation, equipment alignment, routine maintenance by the licensee, and data recording procedures which are related to radiation safety.
91. "Natural radioactivity" means the radioactivity of naturally occurring radioactive substances.
92. "NRC" means Nuclear Regulatory Commission, the U.S. Nuclear Regulatory Commission, or its duly authorized representatives.
- "Nuclear waste" means any highway route controlled quantity (defined in 49 CFR 173.403, 1995 Edition, published October 1, 1995, by the Office of Federal Register National Archives and Records Administration, incorporated by reference and on file with the Agency and the Secretary of State, containing no future editions or amendments) of source, by-product, or special nuclear material required to be in NRC-approved packaging while transported to, through, or across state boundaries to a disposal site, or to a collection point for transport to a disposal site.
93. "Occupational dose" means the dose received by an individual in a restricted area in the course of employment while engaged in activities licensed or registered by the Agency in which the individual's assigned duties involve exposure to sources of radiation, whether in the possession of the licensee, registrant, or other person. Occupational dose does not include dose received: from background radiation, as a patient from medical practices, from voluntary participation in medical research programs, or as a member of the public.
94. "Open beam system" means an analytical x-ray system in which an individual could place some body part in the primary beam path during normal operation.
95. "Package" means the packaging together with its radioactive contents as presented for transport.
96. "Particle accelerator" (see "Accelerator").
97. "Permanent radiographic installation" means a fixed, shielded installation or structure designed or intended for industrial radiography and in which industrial radiography is regularly performed.
98. "Personnel dosimeter" (see "Individual monitoring devices").
99. "Personnel monitoring equipment" (see "Individual monitoring devices").
100. "Personal supervision" means supervision in which the supervising individual is physically present at the site

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where sources of radiation and associated equipment are being used, watching the performance of the supervised individual and in such proximity that immediate assistance can be given if required.

101. "Pharmacist" means an individual licensed by this state to compound and dispense drugs, prescriptions, and poisons.
102. "Physician" means an individual licensed pursuant to Chapter 13 or 17 of Title 32 Arizona Revised Statutes.
103. "Primary beam" means radiation which passes through an aperture of the source housing by a direct path from the x-ray tube or a radioactive source located in the radiation source housing.
104. "Public dose" means the dose received by a member of the public from radiation and to radioactive material released by the licensee or registrant, or exposure to sources of radiation used in licensed or registered operations. It does not include an occupational dose, a dose received from back ground radiation, dose received as a patient from medical practices, or a dose from voluntary participation in medical research programs.
105. "Pyrophoric liquid" means any liquid that ignites spontaneously in dry or moist air at or below 130° F (54.4° C).
106. "Pyrophoric solid" means any solid material, other than one classed as an explosive, which under normal conditions is liable to cause fires through friction, retained heat from manufacturing or processing, or which can be ignited readily and, when ignited, burns so vigorously and persistently as to create that it creates a serious transportation, handling, or disposal hazard. Included are spontaneously combustible and water-reactive materials.
107. "Qualified expert" means an individual certified in the appropriate field by the American Board of Radiology or the American Board of Health Physics, or having equivalent qualifications which provide the knowledge and training to measure ionizing radiation, to evaluate safety techniques, and to advise regarding radiation protection needs; or an individual certified in Therapeutic Radiological Physics or X-ray and Radium Physics by the American Board of Radiology, or having equivalent qualifications that provide training and experience in the clinical applications of radiation physics to radiation therapy, to calibrate radiation therapy equipment. The detailed requirements for a particular qualified expert are provided in the respective Articles of these rules.
108. "Quality Factor" (Q) means the modifying factor, listed in Tables I and II of this Article, that is used to derive dose equivalent from absorbed dose.
109. "Quarter" means a period of time equal to 1/4 of the year observed by the licensee, approximately 13 consecutive weeks, providing that the beginning of the first quarter in a year coincides with the starting date of the year and that no day is omitted or duplicated in consecutive quarters.
110. "Rad" means the special unit of absorbed dose. One rad equals 100 ergs per gram, or 0.01 Gray.
111. "Radiation" means alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. For purposes of these rules, this term is synonymous with ionizing radiation. Equivalent terminology for non-ionizing radiation is defined in Article 14.
112. "Radiation area" means any area accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.05 mSv (0.005 rem) in one hour at 30 centimeters from the source of radiation or from any surface that the radiation penetrates.
113. "Radiation dose" (see "Dose").
114. "Radiation safety officer" (RSO) means the individual designated by the licensee or registrant who has the knowledge, authority and responsibility to apply appropriate radiation protection principles to ensure radiation safety and compliance with the Act, this Chapter and any license conditions.
115. "Radioactive marker" means radioactive material placed subsurface or on a structure intended for subsurface use for the purpose of depth determination or direction orientation.
116. "Radioactive material" means any solid, liquid, or gas which emits radiation spontaneously.
117. "Radioactivity" means emission of electromagnetic energy or particles or both during the transformation of unstable atomic nuclei.
118. "Radiographer" means any individual who performs or personally supervises industrial radiographic operations and who is responsible to the licensee or registrant for assuring compliance with the requirements of this Chapter and all conditions of the license or certificate of registration.
119. "Radiographer's assistant" means any individual who, under the personal supervision of a radiographer, uses sources of radiation, radiographic exposure devices, related handling tools, or survey instruments in industrial radiography.
120. "Radiographic exposure device" means any instrument containing a sealed source therein, in which the sealed source or its shielding thereof may be moved or otherwise changed from a shielded to unshielded position for purposes of making an industrial radiographic exposure.
121. "Registrant" means any person who is registered with the Agency and is legally obligated to register with the Agency pursuant to these rules and the Act.
122. "Registration" is the process by which a person becomes a registrant pursuant to Article 2 of this Chapter. With the exception of registration of persons who install or service radiation machines, the types of registrations issued by the Agency are described in R12-1-1302.
123. "Regulations of the U.S. Department of Transportation" means the federal regulations in 49 CFR 100 through 199, 1992 1995 Edition, published October 1, 1992 1995, by the Office of the Federal Register, National Archives and Records Administration, incorporated herein by reference and on file with the Agency and the Office of the Secretary of State. This incorporation by reference contains no future editions or amendments.
124. "Rem" means the special unit of dose equivalent (see "Dose equivalent"). The dose equivalent in rem is equal to the absorbed dose in rad multiplied by the quality factor (1 rem = 0.01 sievert).
125. "Research and Development" means exploration, experimentation or the extension of investigative findings and theories of a scientific or technical nature into practical application for experimental and demonstration purposes, including the experimental production and testing of models, devices, equipment, materials and processes. Research and Development does not include the internal or external administration of radiation or radioactive material to human beings.
126. "Restricted area" means any area where the licensee or registrant controls access ~~access which is controlled by the licensee~~ for purposes of ~~protection of~~ protecting individuals from exposure to radiation and radioactive material. A restricted area ~~shall~~ does not include any areas

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used for residential quarters, although a room or separate rooms in a residential building may be set apart as a restricted area.

127. "Roentgen" (R) means the special unit of exposure and is equal to the quantity of x or gamma radiation which causes ionization in air equal to 258 microcoulomb per kilogram (see "Exposure").
128. "Safety system" means any device, program or administrative control designed to ensure radiation safety.
129. "Sealed source" means radioactive material that is permanently bonded or fixed in a capsule or matrix designed to prevent release and dispersal of the radioactive material under the most severe conditions which are likely to be encountered in normal use and handling.
130. "Shallow dose equivalent" (H_S), which applies to the external exposure of the skin or an extremity, means the dose equivalent at a tissue depth of 0.007 centimeter (7 mg/cm^2) averaged over an area of one square centimeter.
131. "Shielded position" means the location within a radiographic exposure device or storage container which, by manufacturer's design, is the proper location for storage of the sealed source.
132. "Sievert" means the SI unit of dose equivalent (see "Dose equivalent"). The dose equivalent in sievert is equal to the absorbed dose in gray multiplied by the quality factor ($1 \text{ sv} = 100 \text{ rem}$).
133. "Site boundary" means that line beyond which the land or property is not owned, leased, or otherwise controlled by the licensee or registrant.
134. "Source changer" means a device designed and used for replacement of sealed sources in radiographic exposure devices, including those also used for transporting and storage of sealed sources.
135. "Source holder" means a housing or assembly into which a radioactive source is placed for the purpose of facilitating the handling and use of the source in well-logging operations.
136. "Source material" means:
- Uranium or thorium, or any combination of uranium or thorium thereof, in any physical or chemical form; or
 - Ores that contain by weight 1/20 of 1% (0.05%) or more of uranium, thorium, or any combination of uranium and thorium.
- Source material does not include special nuclear material.
137. "Source material milling" means any activity that results in the production of by-product material as defined by subparagraph (b) of "By-product material".
138. "Source of radiation" means any radioactive material or any device or equipment emitting, or capable of producing, radiation.
139. "Special form radioactive material" means radioactive material that satisfies the all of following conditions:
- It is either a single solid piece or is contained in a sealed capsule that can be opened only by destroying the capsule;
 - The piece or capsule has at least one dimension not less than 5 millimeters (0.2 inch); and
 - It satisfies the test requirements specified in 10 CFR 71, 1993 1996 Edition, published January 1, 1993 1996, by the Office of the Federal Register, National Archives and Records Administration, incorporated herein by reference in this rule and on file with the Agency and the Office of the Secretary of State. This incorporation by reference contains no future editions or amendments. A special form encapsula-

tion designed in accordance with the U.S. Nuclear Regulatory Commission requirements in effect on June 30, 1983, and constructed prior to July 1, 1985, may continue to be used. A special form encapsulation constructed after June 30, 1985, shall meet requirements of this definition applicable at the time of its construction.

140. "Special nuclear material in quantities not sufficient to form a critical mass" means Uranium enriched in the isotope U-235 in quantities not exceeding 350 grams of contained U-235; Uranium-233 in quantities not exceeding 200 grams; Plutonium in quantities not exceeding 200 grams; or any combination of them in accordance with the following formula: for each kind of special nuclear material, determine the ratio between the quantity of that special nuclear material and the quantity specified above for the same kind of special nuclear material. The sum of such ratios for all of the kinds of special nuclear material in combination shall not exceed 1. For example, the following quantities in combination would not exceed the limitation and are within the formula:
- $$\frac{X \text{ gms U-235}}{350} + \frac{Y \text{ gms U-233}}{200} + \frac{Z \text{ gms Pu}}{200} \leq 1$$
141. "Storage area" means any location, facility, or vehicle which is used to store, transport or secure a radiographic exposure device, storage container, sealed source or other source of radiation when it is not in use ~~is use and which area is locked or has a physical barrier to prevent accidental exposure, tampering with or unauthorized removal of the device, container or source.~~
142. "Storage container" means a device in which sealed sources are transported or stored.
143. "Subsurface tracer study" means the release of a substance tagged with radioactive material for the purpose of tracing the movement or position of the tagged substance in the well-bore or adjacent formation.
144. "Survey" means an evaluation of the production, use, release, disposal, or presence of sources of radiation or any combination thereof under a specific set of conditions to determine actual or potential radiation hazards. Such evaluation shall include, but ~~are not~~ ~~not be~~ limited to, tests, physical examination and measurements of levels of radiation or concentration of radioactive material present. "TEDE" means Total Effective Dose Equivalent, the sum of the deep-dose equivalent for external exposures and the committed effective dose equivalent for internal exposures.
145. ~~"Teletherapy"~~ Teletherapy means therapeutic irradiation in which the source of radiation is at a distance from the body.
146. "Temporary job site" means any location where sources of radiation are used other than the specified locations listed on a license document. Storage of sources of radiation at a temporary jobsite shall not exceed 6 months unless the Agency has granted an amendment authorizing storage at that jobsite.
147. "Test" means the process of verifying compliance with an applicable rule, order or license condition.
148. "These rules" means all Articles of A.A.C. Title 12, Chapter 1.
149. ~~"TEDE" means total effective dose equivalent, the sum of the deep-dose equivalent for external exposures and the committed effective dose equivalent for internal exposures.~~

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150. "TODE" means total organ dose equivalent, the sum of the deep-dose equivalent and the committed dose equivalent to the organ receiving the highest dose as described in R12-1-419(C)(1)(d) R12-1-419(C)(1)(f) of these rules.
151. "Unrefined and unprocessed ore" means ore in its natural form prior to any processing, such as grinding, roasting, beneficiating, or refining.
152. "Unrestricted area" (~~uncontrolled area~~) means any area access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive material. Any area used for residential quarters ~~shall be~~ is an unrestricted area.
153. "U.S. Department of Energy" means the Department of Energy established by Public Law 95-91, August 4, 1977, 91 Stat. 565, 42 U.S.C. 7101 et seq., to the extent that the Department exercises functions formerly vested in the U.S. Atomic Energy Commission, its Chairman, members, officers, and components and transferred to the U.S. Energy Research and Development Administration and to the administrator thereof pursuant to of that agency under Sections 104(b), (c) and (d) of the Energy Reorganization Act of 1974 (Public Law 93-438, October 11, 1974, 88 Stat. 1233 at 1237, 42 U.S.C. 5814, effective January 19, 1975) and retransferred to the Secretary of Energy pursuant to under Section 301(a) of the Department of Energy Organization Act (Public Law 95-91, August 4, 1977, 91 Stat. 565 at 577-578, 42 U.S.C. 7151, effective October 1, 1977).
154. "Waste" (see "Low-level waste").
155. "Waste handling licensees" means persons licensed to receive and store radioactive wastes prior to disposal and persons licensed to dispose of radioactive waste.
156. "Week" means seven consecutive days starting on Sunday.
157. "Well-bore" means a drilled hole in which wireline service operations and subsurface tracer studies are performed.
158. "Well-logging" means the lowering and raising of measuring devices or tools which may contain sources of radiation into well-bores or cavities for the purpose of obtaining information about the well and adjacent formations.
159. "Whole body" means, for purposes of external exposure, head, trunk including male gonads, arms above the elbow, or legs above the knee.
160. "Wireline" means an armored cable containing one or more electrical conductors which is used to lower and raise logging tools in the well-bore.
161. "Wireline service operation" means any evaluation or mechanical service which is performed in the well-bore using devices on a wireline.
162. "Worker" means any individual engaged in work under a license issued by the Agency and controlled by employment or contract with a licensee.
163. "WL" means working level, any combination of short-lived radon daughters in one liter of air that will result in the ultimate emission of $1.3E + 5$ MeV of potential alpha particle energy. The short-lived radon daughters are -- for radon-222: polonium-218, lead-214, bismuth-214, and polonium-214; and for radon-220: polonium-216, lead-212, bismuth-212, and polonium-212.
164. "WLM" means working level month, an exposure to one working level for 170 hours -- 2,000 working hours per year divided by 12 months per year is approximately equal to 170 hours per month.

165. "Year" means the period of time beginning in January used to determine compliance with the provisions of these rules. The licensee or registrant may change the starting date of the year used to determine compliance by the licensee or registrant provided that the change is made at the beginning of the year and that no day is omitted or duplicated in consecutive years.

R12-1-103. Exemptions

- A. Common and contract carriers, freight forwarders, and warehousemen who are subject to 49 CFR 107.103, 107.109, 107.111, 107.113, 171.2, 171.3, 172.200, 173.1, 173.3, 173.4, 173.401, 174.7, 175.3, 175.5, 175.10, 176.3, 176.5, 176.11, 176.24, 176.27, and 177.801 (1992 1995 Edition, published July 1, 1992 October 1, 1995) of the U.S. Department of Transportation or 39 CFR 111.1 of the U.S. Postal Service, 1995 (1993 Edition, published July 1, 1993 January 1), both published by the Office of the Federal Register, National Archives and Records Administration, incorporated herein by reference and on file with the Agency and the Office of the Secretary of State, are exempt from this Chapter. In addition, they are exempt from this Chapter to the extent that they transport or store sources of radiation radioactive material, for periods of less than 72 hours, in the regular course of their carriage for another or storage incident thereto. Private carriers who are subject to the regulations of the U.S. Department of Transportation are exempt from this Chapter to the extent that they transport ~~sources of radiation radioactive material~~. Common, contract, and private carriers who are not subject to the regulations of the U.S. Department of Transportation or the U.S. Postal Service are subject to this Chapter. The above incorporation by reference contains no future editions or amendments.
- B. Any U.S. Department of Energy contractor or subcontractor and any U.S. Nuclear Regulatory Commission contractor or subcontractor of the following categories operating within this state is exempt from this Chapter to the extent that such contractor or subcontractor under his the contract receives, possesses, uses, transfers or acquires sources of radiation:
1. No change.
 2. No change.
 3. No change.
 4. No change.
 - a. No change.
 - b. No change.
- C. Any licensee who delivers to a carrier for transport any package which contains radioactive material having a specific activity of 74 kBq/kg (2 nanocuries per gram) or less, is exempt from the provisions of this Chapter with respect to that package.

**ARTICLE 2. REGISTRATION AND CERTIFICATION OF
IONIZING RADIATION MACHINE FACILITIES,
REGISTRATION OF SERVICES, AND LICENSING OF
NONIONIZING RADIATION MACHINE FACILITIES**

R12-1-202. Application Requirements for Registration or Certification of Radiation Machines Ionizing and Nonionizing Radiation Machine Facilities; Notification

- A. ~~No person shall~~ A person shall not receive, possess, use, or transfer a radiation machine except as authorized pursuant to this Article.
- B. The owner or persons having possession of any nonexempt radiation machine shall apply for registration with the Agency within 90 days following the effective date of this Article. Subsequent applications for registration shall be submitted within 30 days after acquisition of a nonexempt radiation ma-

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chine. The application shall be on the form or forms as prescribed in Appendix A to this Article.

- C. No change.
- D. In addition to the application form, the applicant shall remit the appropriate registration fee, pursuant to Article 13, and such other information as may be required to comply with R12-1-208.
- E. With the application forms for registration of radiation machines, except dental and mammography facilities, the applicant shall provide a scale drawing of the room in which a stationary x-ray system is located. The drawing shall denote the type of materials and thickness (or lead equivalence) of each barrier of the room (walls, ceilings, floors, doors, windows). The drawing shall also denote the type and frequency of occupancy in adjacent areas including those above and below the x-ray room of concern (for example, hallways, offices, parking lots, and toilets). Estimates of workload shall also be provided with the drawing.

R12-1-204. Issuance of Notice of Registration

- A. No change.
- B. All radiation machines located on at the same facility may be registered under using 1 Notice of Registration.

**ARTICLE 4. STANDARDS FOR PROTECTION AGAINST
IONIZING RADIATION**

R12-1-418. Surveys and Monitoring

- A. No change.
 - 1. No change.
 - 2. No change.
 - a. No change.
 - b. No change.
- B. No change.
- C. No change.
 - 1. No change.
 - 2. No change.
- D. The licensee or registrant shall ensure that adequate precautions are taken to prevent a deceptive exposure of an individual monitoring device and that personnel monitoring device has been first issued during any reporting period.
- E. No change.
 - 1. No change.
 - 2. No change.
 - a. No change.
 - b. No change.
 - c. No change.
 - d. No change.

R12-1-419. Conditions Requiring Individual Monitoring of External and Internal Occupational Dose

- A. Each licensee or registrant shall monitor exposures from sources of radiation at levels sufficient to demonstrate compliance with the occupational dose limits of this Article. As a minimum:
 - 1. Each licensee or registrant shall monitor occupational exposure to radiation and shall supply and require the use of individual monitoring devices by:
 - a. Adults likely to receive, in one year from sources external to the body, a dose in excess of 10% of the limits in R12-1-408(A);
 - b. Minors and declared pregnant women likely to receive, in one year from sources external to the body, a dose in excess of 10% of any of the applicable limits in R12-1-414 or R12-1-415;
 - c. Individuals entering a high or very high radiation area; and

- d. Individuals working with medical fluoroscopic equipment.

- i. An individual monitoring device used for the dose to an embryo/fetus of a declared pregnant woman, pursuant to R12-1-408(A), shall be located under the protective apron at the waist. A qualified expert shall be consulted to determine the dose to the embryo/fetus for the rare occasion in which this individual monitoring device has a monthly reported dose equivalent value in excess of 0.5 mSv (50 mrem). For purposes of these regulations, the value to be used for determining the dose to an embryo/fetus pursuant to R12-1-415(C)(1), for occupational exposure to radiation from medical fluoroscopic equipment shall be the value reported by the individual monitoring device worn at the waist underneath the protective apron which has been corrected for the particular individual and her work environment by a qualified expert;
- ii. An individual monitoring device used for eye dose equivalent shall be located at the neck, or an unshielded location closer to the eye, outside the protective apron;
- iii. When only one individual monitoring device is used to determine the effective dose equivalent for external radiation pursuant to R12-1-408(C)(2), it shall be located at the neck outside the protective apron. When a second individual monitoring device is used for the same purpose, it shall be located under the protective apron at the waist. (Note: The second individual monitoring device is required for a declared pregnant woman.)

2-B. As a minimum, each licensee or registrant shall monitor, to determine compliance with R12-1-411, the occupational intake of radioactive material by and assess the committed effective dose equivalent to:

- a-1.** Adults likely to receive, in one year, an intake in excess of 10% of the applicable ALI in Table I, Columns 1 and 2 of Appendix B; and
- b-2.** Minors and declared pregnant women likely to receive, in one year, a committed effective dose equivalent in excess of 0.5 mSv (0.05 rem).

3-C. Records.

- a-1.** Each licensee or registrant shall maintain records of doses received by all individuals for whom monitoring is required pursuant to this Section, and records of doses received during planned special exposures, accidents, and emergency conditions. Assessments of dose equivalent and records made using units in effect before January 1, 1994, need not be changed. These records shall include, when applicable:
 - i-a.** The deep-dose equivalent to the whole body, eye dose equivalent, shallow dose equivalent to the skin, and shallow dose equivalent to the extremities;
 - ii-b.** The estimated intake of radionuclides, see R12-1-409;
 - iii-c.** The committed effective dose equivalent assigned to the intake of radionuclides;
 - iv-d.** The specific information used to calculate the committed effective dose equivalent pursuant to R12-1-411(C);
 - v-e.** The total effective dose equivalent when required by R12-1-409; and
 - vi-f.** The total of the deep-dose equivalent and the com-

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mitted dose to the organ receiving the highest total dose;

- b.2. The licensee or registrant shall make entries of the records specified in paragraph subsection (C)(1) above, at intervals not to exceed one year;
- e.3. The licensee or registrant shall maintain the records specified in paragraph subsection (C)(1) above, on Agency Form Z (available from the Agency), in accordance with the instructions for Agency Form Z, or in clear and legible records containing all the information required by this subsection;
- d.4. The licensee or registrant shall maintain the records of dose to an embryo/fetus with the records of dose to the declared pregnant woman. The declaration of pregnancy, including the estimated date of conception, shall also be kept on file but may be maintained separately from the dose records;
- e.5. The licensee or registrant shall retain each required form or record for three years after the Agency terminates each pertinent license or registration requiring the record.

R12-1-438. Disposal of Specific Wastes

- A. No change.
 - 1. No change.
 - 2. No change.
- B. No change.
- C. Records. The licensee shall maintain records in accordance with R12-1-407 R12-1-441.

R12-1-448. Additional Reporting Requirements

- A. Each licensee shall notify the Agency immediately, not later than 4 hours after the discovery of an event, and take immediate protective actions necessary to avoid exposures to radiation or radioactive materials that could exceed the limits specified in this Chapter or releases of licensed material that could exceed the limits specified in this Chapter (events may include fires, exposures, toxic gas releases, etc.).
- B. Each licensee shall notify the Agency within 24 hours after the discovery of any of the following events involving licensed material:
 - 1. A contamination event that:
 - a. Requires access to the contaminated area, by workers or the public, being restricted for more than 24 hours by the imposition of additional radiological controls to prohibit entry into the area;
 - b. Involves a quantity of radioactive material greater than 5 times the lowest annual limit on intake specified in Appendix B of this Article; and
 - c. Results in access to the contaminated area being restricted for a reason other than to allow radionuclides with a half-life of less than 24 hours to decay prior to decontamination.
 - 2. An event in which equipment is disabled or fails to function as designed when:
 - a. The equipment is part of a system designed to prevent releases exceeding the limits specified in this Chapter, to prevent exposures to radiation and radioactive materials exceeding limits specified in this Chapter, or to mitigate the consequences of an accident;
 - b. The equipment performs a safety function and
 - c. No redundant equipment is available and operable to perform the required safety function.
 - 3. An event that requires urgent medical treatment of an individual with radioactive contamination on the individual's clothing or body.

- 4. A fire or explosion damaging any licensed material or any device, container, or equipment containing licensed material when:

- a. The quantity of material involved is greater than 5 times the lowest annual limit on intake specified in Appendix B of this Article; and
- b. The damage affects the integrity of the licensed material or its container.

- C. Each licensee shall make reports required by subsections (A) and (B) above by telephone to the Agency. To the extent that the information is available at the time of notification, the information provided in these reports shall include:
 - 1. The caller's name and call back telephone number;
 - 2. A description of the event, including date and time;
 - 3. The exact location of the event;
 - 4. The isotopes, quantities, and chemical and physical form of the licensed material involved; and
 - 5. Any personnel radiation exposure data available.
- D. Each licensee who makes a report required by subsections (A) or (B) above shall submit a written follow-up report within 30 days of the initial report. Written reports prepared pursuant to other rules may be submitted to fulfill this requirement if the reports contain all of the necessary information and the appropriate distribution is made. The licensee shall send the written report must be sent to the Agency. The report shall include the following:
 - 1. A description of the event, including the probable cause and the manufacturer and model number (if applicable) of any equipment that failed or malfunctioned;
 - 2. The exact location of the event;
 - 3. The isotopes, quantities, and chemical and physical form of the licensed materials involved;
 - 4. Date and time of the event;
 - 5. Corrective actions taken or planned and the results of any evaluations or assessments; and
 - 6. The extent of exposure of individuals to radiation or to radioactive materials without identification of individuals by name.

ARTICLE 5. RADIATION SAFETY REQUIREMENTS FOR INDUSTRIAL RADIOGRAPHIC OPERATIONS

R12-1-506. Quarterly inventory

Each licensee or registrant shall conduct a quarterly physical inventory to account for all sources of radiation received or possessed. The records of the inventories shall be retained for three years from the date of the inventory and shall include the quantities show for each source the associated radioactivity, and kinds of radioactive material, the number and models of x-ray machines, if applicable, the location of all sources of radiation, and the date of the inventory, and the signature of the individual performing the inventory.

R12-1-511. License Application Requirements for Industrial Radiography

In addition to the licensing requirements set forth in R12-1-309, a specific license or registration for industrial radiography will be issued only if:

- 1. The applicant provides a program providing the instruction specified in R12-1-521 for radiographers and assistant radiographers and submits to the Agency a schedule or description of the training program which specifies the:
 - a. Initial training;
 - b. Periodic training;
 - c. On-the-job training; and
 - d. Means of testing to be used by the licensee or regis-

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trant to determine a radiographer's or assistant radiographer's knowledge and understanding of and ability to comply with the Agency rules and licensing requirements, and the operating and emergency procedures of the applicant.

2. The applicant has established and submits to the Agency written operating and emergency procedures to fulfill the requirements of this Chapter.
3. The applicant will have an internal system adequate to assure that Agency rules, Agency license provisions, and the applicant's operating and emergency procedures are followed by radiographers and radiographer's assistants. The inspection system shall include the performance of internal inspections at intervals not to exceed 3 months and the retention of records of such inspections for 2 years.
4. The applicant submits to the Agency a description of the overall organizational structure of the industrial radiography program, including specified delegations of authority and the responsibility for operation of the program.
5. The sealed source radiographer applicant who desires to conduct leak tests has established procedures to be followed in leak testing sealed sources for possible leakage and contamination and submits to the Agency a description of such procedures including:
 - a. Instrumentation to be used;
 - b. Method of performing tests, for example, points on equipment to be smeared and method of taking smear; and
 - c. Pertinent experience of the person who will perform the test; and
6. The applicant complies with appropriate provisions of this Article and Article 3.

R12-1-521. Requirements for Radiographers and Radiographer's Assistants

- A. The licensee or registrant shall not permit any individual to act as a radiographer until such individual:
 1. No change.
 - a. No change.
 - i. No change.
 - ii. No change.
 - iii. No change.
 - iv. No change.
 - v. No change.
 - b. No change.
 - i. No change.
 - ii. No change.
 - iii. No change.
 - c. No change.
 - i. No change.
 - ii. No change.
 - iii. No change.
 - iv. No change.
 2. Has received copies of this Article, and Articles 4 and 10, the license or certificate of registration, and the licensee's or registrant's operating and emergency procedures; and
 3. No change.
 4. Has demonstrated understanding of the requirements in this subsection by successful completion of a written test, approved by the Agency in accordance with R12-1-310(F)(1) R12-1-511, with a score of 70% or better and a field examination with a score of 100% on the subjects covered.
- B. The licensee or registrant shall not permit any individual to act as a radiographer's assistant until such the individual:
 1. No change.

2. Has demonstrated competence to use under the personal supervision of the radiographer the sources of radiation, related handling tools, and radiation survey instruments which will be employed in his the assignment; and
3. Has demonstrated understanding of the requirements in this subsection by successful completion of a written or oral test, approved by the Agency in accordance with R12-1-310(F)(1) R12-1-511, with a score of 70% or better and a field examination with a score of 100% on the subjects covered.

C. No change.

D. No change.

1. No change.
2. No change.
3. No change.

R12-1-523. Personnel Monitoring Control

A. No change.

B. No change.

1. Pocket dosimeters shall meet the criteria in American National Standards Publication N13.5-1972, "Performance Specifications For Direct Reading and Indirect Reading Pocket Dosimeters for X- and Gamma Radiation," 1972 Edition, published December 9, 1971, by the American National Standards Institute, incorporated here in by reference and on file with the Agency and the Office of the Secretary of State; and shall have a range of 0 to 51.6 microcoulomb/ kg (200 milliroentgen). This incorporation by reference contains no future editions or amendments.
2. No change.
3. No change.
 - a. No change.
 - b. No change.
4. No change.
5. No change.
6. No change.
7. No change.

C. Film badges and TLDs:

1. No change.
2. No change.
3. No change.
4. Records of film badge or TLD personnel monitoring shall be kept until disposal is authorized by the Agency maintained according to R12-1-419.

D. No change.

1. No change.
2. No change.
3. No change.
4. No change.
5. No change.

R12-1-541. Enclosed Radiography Using X-ray Machines

- A. ~~Certified and certifiable Cabinet cabinet x-ray systems, as defined in Article 1, certified as manufactured in conformance with 21 CFR 1020.40, revised as of April 1, 1988, incorporated herein by reference and on file in the Office of the Secretary of State, are exempt from other requirements of Article 5, provided the following conditions are met.~~
 1. The registrant shall make, or cause to be made, an evaluation of each certified cabinet x-ray system, at intervals not to exceed 12 months, to determine conformance with 21 CFR 1020.40 the standards for certified and certifiable cabinet x-ray systems defined in Article 1. Records of such evaluations shall be retained ~~until the Agency authorizes their disposal for three years from the date of their creation; and~~
 2. No change.

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B. ~~uncertified cabinet~~ Cabinet x-ray systems not exempted in subsection (A) shall comply with all other applicable provisions of this Article and the following special requirements:

1. No change.
2. No change.
3. No change.
4. No change.
5. No change.

C. No change.

1. No change.
2. No change.
3. No change.
4. No change.
5. No change.
6. No change.
7. No change.
8. No change.
9. No change.
10. No change.

ARTICLE 6. USE OF X-RAYS IN THE HEALING ARTS

R12-1-605. General Equipment Requirements

A. No change.

B. No change.

C. No change.

1. No change.

Table I

Design operating range (Kilovolts peak)	Measured potential (Kilovolts peak)	Half-value layer (Milli- meters of aluminum)
Below 51	30	0.3
	40	0.4
	50	0.5
	51	1.2
51 to 70	60	1.3
	70	1.5
	71	2.1
	80	2.3
Above 70	90	2.5
	100	2.7
	110	3.0
	120	3.2
	130	3.5
	140	3.8
	150	4.1

2. No change

Table II
No change.

3. No change.
4. No change.
5. No change.

D. No change.

E. No change.

F. No change.

G. No change.

R12-1-610. Dental Intraoral Radiographic Systems

A. Equipment

1. The protective tube housing shall be of diagnostic type.
2. Diaphragms or cones shall be used for restricting the useful beam and shall provide the same degree of protection as the housing. The diameter of the useful beam at the

end of the cone or spacer frame shall not be more than 7.6 centimeters (3 inches) for intraoral radiography.

3. A cone or spacer frame shall provide a source-to-skin distance of not less than 17.8 centimeters (7 inches) with apparatus operating above 50 kVp or 10 centimeters (4 inches) with apparatus operating at 50 kVp or below for intraoral radiography.

4. A timer shall be provided to terminate the exposure at a preset time interval, present product of current and time, and preset number of pulses, or a preset radiation exposure to the image receptor.

5. It shall not be possible to make an exposure when the timer is set to the "zero" or "off" position.

6. The tube head shall remain stationary when placed in exposure position.

7. The exposure initiating device shall meet the requirements of a "dead-man"-type switch.

8. The control panel shall include:

- a. A device (usually a milliammeter) which will give positive indication during radiation production; and
- b. Indicators labeled control settings or meters indicating the appropriate technical factors: kVp, mA, exposure time, or mass, and special mode selected for the exposure.

B. Structural shielding

1. Dental installations shall be provided with such primary barriers and/or secondary protective barriers as are necessary to assure compliance with Article 4 of this Chapter.

2. When dental x-ray units are installed in adjacent rooms or areas, protective barriers shall be provided between the rooms or areas.

3. Each installation shall be provided with a protective barrier for the operator or shall be so arranged that the operator can stand at least 1.82 meters (6 feet) from the patient and well away from the useful beam.

4. The operator's position shall be arranged to allow visual contact with the patient during exposure.

5. Structural shielding. When a mobile unit is used routinely in 1 location, it shall be considered a fixed installation.

Note: In many cases structural materials of ordinary walls suffice as a protective barrier without addition of special shielding material.

C. Operating procedures

1. Neither the dentist nor the dentist's assistants shall hold patients or films during exposure, nor shall any individual be regularly used for this service. Only persons required for the radiographic procedure shall be in the radiographic room during exposures.

2. During each exposure, the operator shall stand at least 1.82 meters (6 feet) from the patient or behind a protective barrier.

3. Only the patient shall be in the useful beam.

4. Neither the tube housing nor the cone shall be hand-held during the exposure.

5. Fluoroscopy without image intensification shall not be used in dental examinations.

R12-1-614. Mammographic Systems

A. Equipment

1. No change.
2. No change.
3. No change.
4. No change.
5. No change.
6. No change.
7. No change.

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- a. No change.
- b. No change.
- 8. No change.
 - a. No change.
 - b. No change.
- 9. No change.
- 10. No change.
- 11. No change.
- 12. No change.
- 13. No change.
- 14. Cassettes shall not be used for mammography if 1 or more areas of greater than 1 square centimeter or 2 or more areas of less than 1 square centimeter of poor screen-film contact are seen when tested using a 30-40 40 mesh screen test.
- 15. No change.
 - a. No change.
 - b. No change.
- 16. No change.
- 17. No change.
- B. No change.
 - 1. No change.
 - 2. No change.

ARTICLE 9. RADIATION SAFETY REQUIREMENTS FOR PARTICLE ACCELERATORS

R12-1-901. Purpose and Scope

- A. This ~~part~~ Article establishes procedures and requirements for the registration and the use of particle accelerators.
- B. In addition to the requirements of this Article, all registrants are subject to the requirements of Articles 1, 2, 4 and 10. Registrants engaged in industrial radiographic operations are subject to the requirements of Article 5, and registrants engaged in the healing arts are subject to the requirements of Article 6 of these ~~regulations~~ rules. Registrants engaged in the use or production of radioactive material are subject to the requirements of Article 3.

R12-1-902. Registration Requirements

No ~~A~~ person shall not receive, possess, use, transfer, or acquire a particle accelerator except as authorized in a registration issued pursuant to these ~~regulations~~ rules or as otherwise provided for in these ~~regulations~~ rules. The general procedures for registration of particle accelerator facilities are included in Article 2 of these ~~regulations~~ rules.

R12-1-903. General Requirements for the Issuance of a Registration for Particle Accelerators

In addition to the requirements of Article 2, a registration application for use of a particle accelerator will be approved only if the Agency determines that:

- 1. The applicant is qualified by reason of training and experience to use the accelerator in question for the purpose requested in accordance with this Article, ~~Article 4~~, and ~~Articles 4 and Article 10~~ of these ~~regulations~~ rules in such a manner as to minimize danger to public health and safety or property;
- 2. No change.
- 3. The issuance of the registration will not be inimical to the health and safety of the public, and the applicant satisfies any applicable special requirement in R12-1-904 of this ~~regulation~~ these rules;
- 4. No change.
- 5. The applicant and/or his applicant's staff has substantial experience in the use of particle accelerators for the intended uses;

- 6. If the applicant is a medical institution having an existing radiation safety committee, the committee shall be responsible for approving the applicant has established a radiation safety committee to approve, in advance, proposals for uses of particle accelerators, whenever deemed necessary by the Agency (For purposes of this rule a medical institution is defined as any organization dedicated to providing medical and surgical care for the sick on an overnight basis); and
- 7. No change.

R12-1-907. Shielding and safety design requirements

- A. No change.
- B. Each The registrant shall provide each particle accelerator installation shall be provided with such the primary and/or secondary barriers as that are necessary to assure compliance with Sections R12-1-402 and R12-1-406 R12-1-408 and R12-1-416.

R12-1-909. Warning Devices

- A. All areas, except those in medical facilities, locations designated as high radiation areas, and entrances to the areas such locations shall be equipped with easily observable flashing or rotating warning lights that operate light system that operates when, and only when, radiation is being produced. In lieu of the above, medical facilities shall be equipped with a continuously operating warning light system.
- B. Except in facilities designed for human exposure, each high radiation area shall have an audible warning device which shall be activated for 15 seconds prior to the possible creation of such the high radiation area. Such The warning device shall be clearly discernible in all high radiation areas and all radiation areas.
- C. Barriers, temporary or otherwise, and pathways leading to high radiation areas shall be identified in accordance with Section R12-1-411 R12-1-428 and R12-1-429.

R12-1-912. Ventilation Systems

- A. Means shall be provided A registrant or licensee shall provide the means to ensure that personnel entering any area where airborne radioactivity may be produced will not be exposed to airborne radioactive material in excess of those limits specified in Article 4, Appendix A, Table I of this Chapter Appendix B, Table II of this Chapter.
- B. A registrant or licensee as required by R12-1-407 shall not vent, release or otherwise discharge airborne radioactive material to an uncontrolled area which exceed the limits specified in Article 4, Appendix A — Table II of this Chapter Appendix B, Table II of this Chapter, except as authorized pursuant to Section R12-1-417 or subsection R12-1-407(B) of this Chapter R12-1-435. For purposes of this Section, concentrations may be averaged over a period not greater than one year. Every reasonable effort should be made to maintain releases of radioactive material to uncontrolled areas as far below these the limits in Appendix B, Table II of this Chapter as practicable.

ARTICLE 11. RADIATION SAFETY REQUIREMENTS FOR URANIUM AND THORIUM MILL TAILINGS

R12-1-1101. Scope

The regulations in this Article establish requirements for uranium and thorium mill tailing piles and ponds associated with active mills, inactive mills, and closed or abandoned mills. The provisions of this Article are in addition to, and not in substitution for, other applicable provisions of:

- 1. These regulations, and

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2. Any specific license issued to a mill operator, pursuant to Section R12-1-312 of these regulations, subsequent to June 4, 1971.

R12-1-1102. Maintenance of Piles and Ponds at all Mills

- A. If pile edges are adjacent to a river, creek, gulch or other water course that might reasonably be expected to erode the edges during periods of high water, the exposed slopes shall be stabilized and the edges shall be diked and riprapped sufficiently to prevent erosion of the pile.
- B. Drainage ditches shall be provided around the pile edges sufficient to prevent surface runoff water from neighboring land from reaching and eroding the pile.
- C. Access to the pile and pond areas shall be controlled by the operator or owner and property posted.
- D. The pile shall be maintained in such a manner that excessive erosion of, or environmental hazard from radioactive materials does not occur.
- E. The owner of the tailing pile site shall give the AAEC written notice thirty (30) days in advance of any contemplated transfer of right, title of interest in the site by deed, lease, or other conveyance. The written notice shall contain the name and address of the proposed purchaser of transferee. Prior written approval of the AAEC shall be obtained before the surface area of the land shall be put to use, and it shall have been determined that the radiation dosage to the public resulting from the proposed use does not exceed 0.5 rem per year.
- F. With the exception of reprocessing at the site, prior written approval of the AAEC must be obtained before any tailings material is removed from any active or inactive mill site or tailings site.
- G. The AAEC may waive or modify individual requirements in regard to stabilization or utilization of tailings material if it can be shown that they are unnecessary or impracticable in specific cases.

R12-1-1103. Additional requirements for inactive mills

- A. Before abandonment, sale, or transfer of any kind and in any manner of a tailings site, the operator shall determine that all requirements of Section R12-1-1102 are fulfilled at such site. If the requirements of Section R12-1-1102 are not fulfilled at such time, the operator who abandons, sells, or transfers such site shall fulfill the requirements of Section R12-1-1102 and shall, in addition, return to the site any tailings pile material which has been removed from the tailings pile by natural forces.
- B. Before abandonment, sale, or transfer of any kind and in any manner of a tailings site, the operator shall determine that the following requirements are fulfilled:
1. Ponds shall be drained and covered with materials that prevent blowing of dust. Water drained from the ponds shall be disposed of in a manner approved by the Arizona State Department of Health Services and the AAEC.
 2. Taking into consideration the types of materials at each site, piles shall be leveled and graded so that there is, insofar as possible, a gradual slope to ensure that there shall be no low places on the pile where water might collect. Side slopes shall be stabilized by riprap, dikes, reduction of grades, vegetation, or any other method or combination of methods that will ensure stabilization.
 3. The pile shall be stabilized against wind and water erosion. The method of stabilization may consist of vegetation or a cover of soil, soil containing rock or stone, cement or concrete products, petroleum products, or any other soil stabilization material presently recognized or which may be recognized in the future, or any combina-

tion of the foregoing as may be required for proper protection from wind, or water erosion.

4. Detailed plans for stabilizing tailings piles shall be submitted to the AAEC for review and approval prior to undertaking stabilization of the pile.
5. If the requirements of R12-1-1103(B)(1), (2), (3), and (4) are not fulfilled before the abandonment, sale, or transfer of a tailings site, the operator who abandons, sells, or transfers such site shall fulfill the requirements of R12-1-1103(B)(1), (2), (3), and (4) and shall, in addition, return to the site any tailings pile material which has been removed from the tailings pile by natural forces.

R12-1-1104. Waiver

The AAEC will waive the requirements of R12-1-1103 for a sale or transfer of a mill tailings site to a person who plans to continue operating the associated mill or mills for the same purpose. Such waiver shall not be granted until the new operator has obtained a license from the AAEC pursuant to Section R12-1-312 of these regulations.

ARTICLE 13. LICENSE AND REGISTRATION FEES

R12-1-1302. Types of Licenses and Registrations

- A. Category A licenses shall be those specific licenses which authorize a school, college, university, or other teaching facility to possess and use radioactive materials for instructional or research purposes. A category A license may not be combined with any other type of license.
1. No change.
 2. No change.
 3. No change.
 4. No change.
- B. Category B licenses shall consist of ~~are those~~ specific or general licenses which authorize the application of radioactive material or the radiation therefrom to a human being for medical diagnostic, therapeutic, or research purposes, or the use of radioactive material in medical laboratory testing. Except for a type B6, general medical license, a category B license may not be combined with a license of any other category.
1. No change.
 2. No change.
 3. No change.
 4. No change.
 5. No change.
 6. No change.
- C. Category C licenses shall consist of ~~are those~~ specific or general licenses authorizing the use of radioactive materials in any activity other than those authorized by a category A, B, or D license. Except as specifically authorized in this Section, a category C license may not be combined with any other type of license.
1. No change.
 2. No change.
 3. No change.
 4. No change.
 5. No change.
 6. No change.
 7. No change.
 8. No change.
 9. No change.
 10. No change.
 11. No change.
 12. No change.
 13. No change.
 14. No change.
 15. No change.

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D. Category D licenses shall consist of the are the following specific radioactive material licenses. Except for type D4, depleted uranium, and type D14, additional facilities licenses, a category D license may not be combined with any other license.

1. No change.
2. No change.
3. No change.
4. No change.
5. No change.
6. No change.
7. No change.
8. No change.
9. No change.
10. No change.
11. A low-level, radioactive waste, land disposal facility license is one which is issued for a "land disposal facility" as that term is used in R12-1-430 and R12-1-431 R12-1-439 and R12-1-442; is constructed and operated in accordance with 10 CFR 61, 1985 1996 edition, published January 1, 1985, by the Office of the Federal Register, National Archives and Records Administration, incorporated herein by reference and on file with the Agency and the Office of the Secretary of State, containing no future editions or amendments; and has a closure or long-term care plan meeting the requirements of 10 CFR 61.
12. No change.
13. No change.
14. No change.
15. No change.
16. No change.
17. A radioactive waste transfer for disposal license is an authorization for the generator of radioactive waste to transfer the radioactive waste for disposal at a licensed disposal site pursuant to R12-1-430 and R12-1-431. This license is subject to a special fee as provided by R12-1-4307 but is exempt from annual fees. Reserved.

E. No change.

1. No change.
2. No change.
3. No change.
4. No change.
5. No change.
6. No change.
7. No change.
8. No change.
9. No change.
10. No change.
11. No change.
12. No change.
13. No change.
14. No change.
15. No change.
16. No change.
17. No change.

R12-1-1306. Schedule of Fees

A. The application and annual fee for each category type shall be as are shown in Table 13-1.

Table 13-1

Category	Type	Annual fee
A1.	Broad academic class A	\$2,600
A2.	Broad academic class B	\$1,500
A3.	Broad academic class C	\$1,200
A4.	Limited	\$600

B1.	Broad medical	\$1,650
B2.	Medical materials class	\$1,400
B3.	Medical materials class B	\$1,000
B4.	Medical materials class C	\$500
B5.	Medical teletherapy	\$1,650
B6.	General medical	\$75
C1.	Broad industrial class A	\$2,200
C2.	Broad industrial class B	\$1,600
C3.	Broad industrial class C	\$1,250
C4.	Limited industrial	\$500
C5.	Portable gauge	\$500
C6.	Fixed gauge class A	\$800
C7.	Fixed gauge class B	\$500
C8.	Leak detector	\$500
C9.	Gas chromatograph	\$300
C10.	General industrial	No Fee
C11.	Industrial radiography class A	\$1,650
C12.	Industrial radiography class B	\$1,500
C13.	Open field irradiator	Full Cost
C14.	Self-shielded irradiator	\$600
C15.	Well logging	\$1,750
D1.	Distribution	\$2,150
D2.	Nuclear pharmacy	\$2,150
D3.	Nuclear laundry	\$2,250
D4.	Depleted uranium	\$100
D5.	General depleted uranium	\$75
D6.	Veterinary medicine	\$500
D7.	General veterinary medicine	\$75
D8.	Health Physics class A	\$600
D9.	Health physics class B	\$450
D10.	Secondary uranium recovery	\$4,000
D11.	Low-level radioactive waste	
	Disposal Site	Full Cost
		\$3,000,000
D12.	Waste processor class A	\$2,250
D13.	Waste processor class B	\$500
D14.	Additional facility	(1)
D15.	Possession only	(2)
D16.		(3)
D17.		(4) Reserved
D18.	Unclassified	Full Cost
E1.	X-ray machine Class A (per tube)	\$64
E2.	X-ray machine class B (per tube)	\$44
E3.	X-ray machine class C (per tube)	\$36
E4.	Industrial radiation machine (per device)	\$36
E5.	Major accelerator facility	Full Cost
E6.	Tanning facility (per device)	\$24
E7.	Class A laser facility	\$150
E8.	Class B laser facility	\$350
E9.	Class C laser facility	\$600
E10.	Laser light show	\$350
E11.	Medical laser facility (per laser system)	\$40
E12.	Medical RF device facility (per unit)	\$40
E13.	Medical imaging facility (per unit)	\$50
E14.	Class A industrial radiofrequency facility	\$60
E15.	Class B industrial radiofrequency	

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- E16. facility\$180
Class C industrial radiofrequency
facility\$300
E17. Other radiation machine. Full Cost

Notes: (1) 20% of the base fee for each additional site, not to exceed 100% additional for all sites.
(2) 50% of the annual fee for the license type required for full use of the stored radioactive materials.
(3) See R12-1-1307.

- B. No change.
1. No change.
a. No change.
b. No change.
c. No change.
2. No change.
3. No change.

ARTICLE 15. TRANSPORTATION

R12-1-1502. Definitions

- A. Terms defined in Article 1 have the same meaning when used in this Article. Federal regulations adopted incorporated by reference in this Article are on file at the Agency and at the Office of the Secretary of State.
- B. The following terms have the meaning set forth below.
1. "Special form" means any of the following physical forms of radioactive material of any transport group:
 - a. The material is in solid form having no dimension less than 0.5 millimeter or at least one dimension greater than 5 millimeters; does not melt, sublime, or ignite in air at a temperature of 1,000°F (538°C); will not shatter or crumble if subjected to the percussion test described in Appendix A of this Article and is not dissolved or converted into dispersible form to the extent of more than 0.005 percent by weight by immersion for 1 week in water at 68°F (20°C) or in air at 86°F (30°C).
 - b. The material is securely contained in a capsule having no dimension less than 0.5 millimeter or at least one dimension greater than 5 millimeters, which will retain its contents if subjected to the tests prescribed in Appendix A of this Article and which is constructed of materials which do not melt, sublime, or ignite in air at 1,475°F (802°C) and do not dissolve or convert into dispersible form to the extent of more than 0.005 percent by weight by immersion for 1 week in water at 68°F (20°C) or in air at 68°F (30°C).

R12-1-1503. Exemptions Reserved

- A. Common and contract carriers, freight forwarders and warehousemen who are subject to the rules and regulations of the U.S. Department of Transportation or the U.S. Postal Service are exempt from this Article to the extent that they transport or, for periods of less than 48 hours, store radioactive material in the regular course of their carriage for another or storage incident thereto. Any carrier who is not subject to the rules and regulations of the U.S. Department of Transportation or the U.S. Postal Service is subject to this Article.
- B. Any licensee who delivers radioactive material to a carrier for transport, in accordance with R12-1-1506, where such transport is subject to the regulations of the U.S. Postal Service, is exempt from the provisions of this Article.
- C. Any licensee who delivers to a carrier for transport any package which contains radioactive material having a specific activity of 2 nanocuries per gram (74 k Bq/kg) or less, is exempt

from the provisions of this Article with respect to that package.

R12-1-1504. Intrastate Transportation and Storage of Radioactive Materials

- A. No A person shall not transport radioactive materials within this state except as provided herein in this rule.
1. A general license is hereby issued subject to R12-1-1504(B), (C), (D) and R12-1-1505 to any licensee to transport and store radioactive material incidental to transportation, provided the transportation is incidental to, and in furtherance of is made to further, the licensee's operations operation.
 2. A general license is hereby issued by this rule to any common or contract carrier not exempt pursuant to R12-1-1503(A), or to any private carrier, in accordance with provisions of R12-1-1504(B), (C) and (D) R12-1-103.
- B. ~~The transportation and storage shall be in accordance with~~ When transporting or storing radioactive materials, a person shall comply with the regulations of the U.S. Department of Transportation, in Title 49, Code of Federal Regulations, Revised as of November 1, 1984, insofar as such regulations relate to the transporting, loading and storage of packages, package specifications, placarding of the transporting vehicle, shipping documentation and certification and incident reporting 49 CFR 171 through 189, 1995 Edition, published October 1, 1995, incorporated by reference and on file with the Agency and the Office of the Secretary of State. This incorporation by reference contains no future editions or amendments.
- C. Any notification of incidents required by those regulations shall in addition be filed with, or made to, the Agency.
- D. Persons who transport and store radioactive material pursuant to the general license in this Section are exempt from the requirements of Article 4 and Article 10 of this Chapter with respect to such transport and storage.
- R12-1-1505. Storing of Radioactive Material in Transport**
- A. No A person shall not store, for any period in excess of 48 72 hours, any package containing radioactive material bearing a DOT Department of Transportation Yellow II or Yellow III label, unless the radioactive material is stored in an area other than and not adjacent to any food storage area or area that is normally occupied by an individual.
1. The radioactive material is stored in an area other than, and not adjacent to, any food storage area or area that is normally occupied by an individual; and
 2. B. Radioactive materials shall not be stored with A person shall not store radioactive material with other hazardous materials, except as authorized by 49 CFR 177.848, regulations of the U.S. Department of Transportation; and U.S. Department of Transportation regulations in 49 CFR 177.848, 1995 Edition, published October 1, 1995, incorporated by reference and on file with the Agency and the Office of the Secretary of State.
3. C. No change.
- B. When transit is interrupted and storage is required for an extended period, the following requirements shall apply:
1. No change.
 - a. No change.
 - b. No change.
 - c. No change.
 - d. No change.
 - e. No change.
 - f. No change.
 - g. No change.
 - h. No change.
 2. No change.

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3. In the event of any accident involving radioactive materials, the Department of Public Safety, Phoenix Duty Officer, shall be immediately notified. The licensee or carrier shall immediately notify the Department of Public Safety of an accident involving radioactive material.

R12-1-1506. Preparation of Radioactive Material for Transport

- A. No A licensee shall not deliver any package containing radioactive material to a carrier for transport or transport radioactive material, unless the licensee has:
1. The Complied with the applicable packaging, monitoring, manifesting, marking, and labeling requirements, appropriate to the mode of transport, of the U.S. Department of Transportation, in 49 CFR 170 through 189, (1984) the U.S. Postal Service in the Postal Service Manual (Domestic Mail Manual), section 124.3, incorporated by reference, 39 CFR 111.1 (1984), 49 CFR 171 through 189, 1995 Edition, published October 1, 1995, incorporated by reference and on file with the Agency and the Office of the Secretary of State, containing no future editions or amendments, or other federal regulations concerning the transport of radioactive material, are complied with, insofar as such regulations relate to the packaging of radioactive material, and to the monitoring, marking and labeling of such packages; and
 2. Procedures have been established Established procedures or safely opening and closing packages in which radioactive material is transported; and
 3. Prior Assured, prior to the delivery of a package to a carrier for transport the licensee has assured that:
 - a. The package is properly closed and
 - b. That any Any special instructions needed to safely open the package are sent or made available to the consignee.
- B. A licensee who transports his own radioactive material shall also comply with all requirements of subsection (A).

R12-1-1507. Packaging Quality Assurance

- A. Licensees utilizing packages which conform to DOT specification 55 may continue to do so until June 30, 1985, pursuant to the requirements of subsection (B) below, provided no new specification 55 container may be manufactured or placed into use.
- B. Quality assurance of packaging. Any licensee who delivers radioactive material to a carrier for transport in a package:
1. For which a license, certificate of compliance or other approval has been issued by the NRC, or
 2. Which meets the applicable criteria specified in 10 CFR 71, shall have, maintain and execute the quality assurance program specified in 10 CFR 71.
- A. Licensees that transport radioactive material in the course of their business or delivers radioactive material to a carrier for transport in a package for which a license, certificate of compliance, or other approval has been issued by the Nuclear Regulatory Commission, or which meets the applicable criteria specified in 10 CFR 71, 1996 Edition, published October 1, 1996, incorporated by reference and on file with the Agency and the Office of Secretary of State, shall have, maintain, and execute the quality assurance program specified in 10 CFR 71. This incorporation by reference contains no future editions or amendments.
- B. Each licensee shall establish, maintain, and execute a quality assurance program as described in 10 CFR 71 to verify that deficiencies and defective material/equipment relative to the shipment of packages containing radioactive material are promptly identified and corrected.

R12-1-1508. Advance notification of transport of nuclear waste

- A. Prior to the transport of any nuclear waste outside of the confines of the licensee's facility or other place of use or storage, or prior to the delivery of any nuclear waste to a carrier for transport, each licensee shall provide advance notification of such transport to the Agency. For the purpose of R12-1-1508, "nuclear waste" means any large quantity of source, by-product, or special nuclear material required to be in NRC approved packaging while transported to, through, or across state boundaries to a disposal site, or to a collection point for transport to a disposal site.
- B. Each advance notification required by R12-1-150(A) in subsection (A) above shall contain the following information:
1. The name, address, and telephone number of the shipper, carrier, and receiver of the shipment;
 2. A description of the nuclear waste contained in the shipment as required by the regulations of the U.S. Department of Transportation, 49 CFR 172.202 and 273.203 172.203(d), 1995 Edition, published October 1, 1995, incorporated by reference and on file with the Agency and the Office of the Secretary of State. This incorporation by reference contains no future editions or amendments;
 3. The point of origin of the shipment and the seven-day period during which departure of the shipment is estimated to will occur;
 4. The seven-day period during which arrival of the shipment at state boundaries is estimated to will occur;
 5. The destination of the shipment, and the seven-day period during which arrival of the shipment is estimated to will occur; and
 6. A point of contact with a telephone number for current shipment information.
- C. The The licensee shall make the notification required by subsection (A) shall be made in writing to the Agency. A notification delivered by mail must be postmarked at least seven days before the beginning of the seven-day period during which departure of the shipment is estimated to occur. A copy The licensee shall maintain a copy of the notification shall be retained by the licensee for one year.
- D. No change.

Appendix A. Tests for Special Form Radioactive Material

1. Free Drop—A free drop through a distance of 30 feet onto a flat essentially unyielding horizontal surface, striking the surface in such position as to suffer maximum damage.
2. Percussion—Impact of the flat circular end of a 1-inch diameter steel rod weighing 3 pounds, dropped through a distance of 40 inches. The capsule or material shall be placed on a sheet of lead, of hardness number 3.5 to 4.5 on the Vickers scale, and not more than 1 inch thick, supported by a smooth essentially unyielding surface.
3. Heating—Heating in air to a temperature of 1,475°F. and remaining at that temperature for a period of 10 minutes.
4. Immersion—Immersion for 24 hours in water at room temperature. The water shall be at pH 6 pH 8, with a maximum conductivity of 10 micromhos per centimeter.

**ARTICLE 17. RADIATION SAFETY REQUIREMENTS
FOR WIRELINE SERVICE OPERATIONS AND
SUBSURFACE TRACER STUDIES**

R12-1-1715. Leak Testing of Sealed Sources

Each A licensee shall test each sealed source containing radioactive material shall be tested for leakage in accordance with the provisions of R12-1-429 R12-1-417. Records of the leak tests shall

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be retained for a period of three years from the date of the test, and a copy shall accompany the source to job sites.

R12-1-1716. Quarterly inventory Inventory

~~Each Every six months each~~ licensee or registrant shall conduct a ~~quarterly physical~~ a inventory to account for all sources of radiation. Records of inventories shall be retained for three years from the date of the inventory and shall include the quantities and kinds of sources of radiation, the location where sources of radiation are assigned, the date of the inventory, and the name of the individual conducting the inventory.

R12-1-1721. Training Requirements

A. No licensee shall permit any individual to act as a logging supervisor as defined in this Article 1 until such individual has:

1. No change.
 - a. No change.
 - i. No change.
 - ii. No change.
 - iii. No change.
 - (1) No change.
 - (2) No change.
 - iv. No change.
 - v. No change.
 - (1) No change.
 - (2) No change.
 - (3) No change.
 - b. No change.
 - i. No change.
 - (1) No change.
 - (2) No change.
 - (3) No change.
 - ii. No change.
 - iii. No change.
 - c. No change.
 - i. No change.
 - ii. No change.
 - iii. No change.
 - iv. No change.
 - d. No change.
 - e. No change.
 - f. No change.
2. No change.
3. No change.

B. ~~No licensee shall~~ A licensee shall not permit any individual to assist in the handling of sources of radiation until such individual has:

1. No change.
2. No change.

C. No change.

R12-1-1723. Personnel Monitoring

A. ~~No licensee shall~~ A licensee shall not permit any individual to act as a logging supervisor or to assist in the handling of sources of radiation unless each such individual wears either a film badge or a thermoluminescent dosimeter (TLD). Each film badge or TLD shall be assigned to and worn by only one individual.

B. No change.

C. Personnel monitoring records shall be ~~retained permanently~~ maintained in accordance with R12-1-419(C).

R12-1-1742. Documents and Records Required at Field Stations

Each licensee utilizing a field station shall have the following documents and records available for the specific devices and sources used at the field station:

1. No change.
2. No change.
3. No change.
4. No change.
5. No change.
6. ~~Quarterly inventories~~ Inventories of sealed sources required pursuant to R12-1-1716;
7. No change.
8. No change.
9. No change.

R12-1-1743. Documents and Records Required at Temporary Job Sites

Each licensee conducting operations at a temporary job site shall have the following documents and records available at that site:

1. No change.
2. No change.
3. No change.
4. When operating in Arizona under reciprocity, a copy of ~~the out-of-state~~ appropriate license, certificate of registration, or equivalent documents; ~~and Agency authorization to enter the state to perform well logging operations.~~

R12-1-1751. Notification of Incidents, Abandonment and Lost Sources

A. Notification of incidents and sources lost in other than down-hole logging operations shall be made in accordance with appropriate provisions of Article 4 of this Chapter.

B. Whenever a sealed source or device containing radioactive material is lodged, the licensee shall notify the Agency of the planned procedures for recovery prior to attempting recovery and shall:

1. Monitor at the surface for the presence of radioactive contamination with a radiation survey instrument or logging tool during logging tool recovery operations; and
2. Notify the Agency immediately by telephone if radioactive contamination is detected at the surface or if the source appears to be damaged.

C. No change.

1. No change.
 - a. No change.
 - b. No change.
 - c. No change.
2. No change.
3. No change.
 - a. No change.
 - b. No change.
 - c. No change.
 - d. No change.
 - e. No change.
 - f. No change.
 - g. No change.
 - h. No change.

D. No change.

1. No change.
2. No change.
 - a. No change.
 - b. No change.
 - c. No change.
 - d. No change.
 - e. No change.
 - f. No change.
 - g. No change.
 - h. No change.

E. No change.

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TITLE 18. ENVIRONMENTAL QUALITY

**CHAPTER 4. DEPARTMENT OF ENVIRONMENTAL QUALITY
SAFE DRINKING WATER**

PREAMBLE

1. Sections Affected

Rulemaking Action

R18-4-101	Amend
R18-4-102	Amend
R18-4-103	Amend
R18-4-104	Amend
R18-4-105	Amend
R18-4-109	Amend
R18-4-116	Amend
R18-4-117	Amend
R18-4-119	Amend
R18-4-121	Amend
R18-4-201	Amend
R18-4-205	Amend
R18-4-206	Amend
R18-4-208	Amend
R18-4-209	Amend
R18-4-212	Amend
R18-4-213	Amend
R18-4-215	Amend
R18-4-216	Amend
R18-4-217	Amend
R18-4-218	Amend
R18-4-219	Amend
R18-4-302	Amend
R18-4-303	Amend
R18-4-307	Amend
R18-4-310	Amend
R18-4-311	Amend
R18-4-314	Amend
R18-4-316	Amend
R18-4-402	Amend
R18-4-403	Repeal
R18-4-403	New Section
R18-4-504	Amend
Appendix A	Amend
Appendix B	Amend

2. The statutory authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):

Authorizing statutes: A.R.S. §§ 49-202(A) and 49-203(A)(8)

Implementing statute: A.R.S. § 49-353

3. The name and address of agency personnel with whom persons may communicate regarding the rulemaking:

Name: Mr. Steven Pawlowski
Address: Department of Environmental Quality
3033 North Central Avenue
Phoenix, Arizona 85012
Telephone: (602) 207-2227
Fax: (602) 207-2251

4. An explanation of the rule, including the agency's reasons for initiating the rule:

ADEQ is proposing the following revisions to the rules which regulate public water systems: 1) repeal the maximum contaminant level and mandatory health effect language for nickel; 2) establish less stringent monitoring requirements for nickel to replace the currently effective monitoring requirements for nickel that are prescribed in R18-4-206; 3) clarify that the maximum contaminant

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levels for arsenic and radiochemicals apply only to drinking water that is distributed by community water systems; 4) amend the monitoring requirements in R18-4-217 to make them more consistent with those found in the National Primary Drinking Water Regulations and to add detection limits for radiochemicals in Appendix B; 5) amend R18-4-119 which regulates additives to drinking water to conform the rule to a recently enacted state statute; 6) repeal special monitoring requirements for water corrosivity characteristics; 7) clarify that vinyl chloride samples and samples that are screened for polychlorinated biphenyls [PCBs] using EPA Methods 505 and 508 cannot be composited; 8) establish limits on reporting analytical results for compliance purposes; 9) clarify the requirements for increased monitoring for nitrate and nitrite; 10) clarify that the maximum contaminant level for PCBs is quantitated as decachlorobiphenyl; and 11) clarify that compliance samples must be identified as such when they are submitted to a laboratory by a water supplier. In addition, ADEQ proposes numerous minor technical amendments to clarify the currently effective drinking water rules, eliminate unnecessary language, correct cross-references, and update incorporations by reference.

Repeal of the Maximum Contaminant Level for Nickel

On July 17, 1992, the U.S. Environmental Protection Agency [EPA] promulgated a maximum contaminant level for nickel of 0.1 mg/L [See 57 FR 31776]. EPA also promulgated associated monitoring, analytical testing, public notification requirements, and best available treatment technologies for nickel. These requirements were adopted by Arizona in drinking water rules that were effective on April 28, 1995.

In September, 1992, the Nickel Development Institute (a nickel trade association) and other industry parties filed a petition for review in the U.S. Court of Appeals for the D.C. Circuit challenging the maximum contaminant level goal [MCLG] and the maximum contaminant level [MCL] for nickel [See *Nickel Development Institute, et. al v. EPA* (No. 92-1407) and *Specialty Steel Industry of the United States v. Browner* (No. 92-1410)]. The industry petitioners raised objections concerning the methodology used for determining the MCLG for nickel. Because the MCL for nickel was based directly on the MCLG, the petitioners also challenged the MCL for nickel. EPA and the petitioners entered into discussions in an attempt to settle this litigation. In the course of these discussions, EPA agreed that it had not fully addressed the petitioners' comments on the methodology for deriving the MCLG for nickel in the rulemaking record and agreed to a voluntary remand of the MCLG and MCL for nickel. EPA and the industry petitioners filed a joint motion for a voluntary remand of the nickel MCLG and MCL. The court granted the motion, remanded the MCLG and MCL for nickel, and dismissed the lawsuits. When the court vacated the MCL for nickel, it left the sampling methodologies and detection limits for nickel in place. At EPA's request, the court also vacated the mandatory health effects language for nickel because: 1) the language mentions the nickel MCL, and 2) the language is unnecessary until EPA reestablishes a nickel MCL. No other aspects of the National Primary Drinking Water Regulations for nickel were vacated by the court.

EPA has stated in the Federal Register that the nickel MCL should be considered vacated and not in effect as of February 23, 1995 [See 60 FR 33929 (June 29, 1995)]. EPA has formally removed the nickel MCL from the Code of Federal Regulations [Id]. For this reason, ADEQ proposes to repeal the MCL for nickel that is

found in R18-4-205. ADEQ also proposes the repeal of the mandatory health effects language for nickel found in Appendix A.

Establish Less Stringent Monitoring Requirements for Nickel at R18-4-403

ADEQ is proposing to establish less stringent monitoring requirements for nickel at R18-4-403. As explained in the previous section, the Court of Appeals for the D.C. Circuit did not vacate the sampling methodologies and detection limits for nickel and EPA has not repealed the monitoring requirements for nickel in the National Primary Drinking Water Regulations. Therefore, ADEQ proposes a new section, R18-4-403, which prescribes special monitoring requirements for nickel. The proposed special monitoring requirements for nickel are less stringent than the nickel monitoring requirements that are found in the currently effective drinking water rules at R18-4-206 because they do not include increased monitoring requirements which are triggered by an exceedance of the MCL for nickel. Increased monitoring requirements which are triggered by an MCL exceedance are now obsolete because the MCL for nickel has been vacated. The special monitoring requirements for nickel are properly located in Article 4 because they are no longer related to determining compliance with a maximum contaminant level.

Amendment of Applicability of Maximum Contaminant Levels for Arsenic and Radiochemicals

EPA amended the National Primary Drinking Water Regulations to clarify that the maximum contaminant level for arsenic applies only to community water systems [See 40 CFR §141.11(a)]. ADEQ proposes to revise R18-4-201 to make this clarification. ADEQ proposes to amend R18-4-201 to clarify that the maximum contaminant levels for radiochemicals apply only to water that is distributed by a community water system. The maximum contaminant levels for radiochemicals do not apply to water distributed by noncommunity water systems [See 40 CFR 141.15 and 40 CFR 141.16].

Amendment of the Radiochemical Rule [R18-4-217]

ADEQ proposes to amend R18-4-217 to make the monitoring requirements in the rule more consistent with the currently effective National Primary Drinking Water Regulation for radiochemicals at 40 CFR 141.26. ADEQ is not proposing any changes to the currently effective maximum contaminant levels for radium-226, radium 228, gross alpha particle radioactivity, or beta particle and photon radioactivity from man-made radionuclides.

The currently effective state rule, R18-4-217(B)(1), requires that a community water system monitor each source for radiochemicals at 4-year intervals. ADEQ proposes to amend this rule and require that a community water system monitor for radiochemicals at points-of-entry to the distribution system. The proposed change from source monitoring to point-of-entry monitoring is consistent with the way that monitoring is conducted by public water systems for other categories of contaminants under the standardized monitoring framework [See R18-4-218]. Also, sampling at the point-of-entry to the distribution system appears to be consistent with the way that currently effective federal regulation addresses monitoring requirements for radiochemicals. 40 CFR

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141.26(a)(2)(iii) provides that a state has the *discretion* to order source water monitoring when a community water system uses two or more sources having different concentrations of radioactivity. This federal regulation implies that routine monitoring for radiochemicals is not conducted at the source because it states that source water monitoring is discretionary. If source water monitoring is discretionary, then routine monitoring for radiochemicals must be conducted at some other location. 40 CFR 141.26(a)(2)(iii) also states that source water monitoring is in addition to monitoring of water "from a free-flowing tap." This reference suggests that routine monitoring for radiochemicals is conducted in the distribution system.

Finally, point-of-entry sampling for radiochemicals is consistent with the monitoring approach set forth by EPA in proposed regulations for radiochemicals [See 56 FR 33050 (July 18, 1991)]. In the preamble to the proposed federal regulations, EPA states that one of its major goals is to make monitoring requirements for radiochemicals consistent with the monitoring requirements for other regulated drinking water contaminants as described in EPA's standardized monitoring framework [Id. at 33103]. EPA proposed that surface water systems and groundwater systems sample for radiochemicals at points in the distribution system which were representative of each source [i.e., at each entry point to the distribution system which is located after any treatment and which is representative of each source (Id. at 33104)].

While EPA's proposed regulations for radiochemicals have not been finalized, they reflect an EPA intention to adopt a point-of-entry monitoring approach for radiochemicals. If point-of-entry sampling is adopted for radiochemicals, then it will reduce the number of sampling sites for community water systems. Also, the same sampling sites may be used for the collection of samples for other contaminants such as inorganic chemicals and volatile organic chemicals, which simplifies sample collection efforts. ADEQ therefore proposes to repeal source monitoring and adopt point-of-entry sampling for radiochemicals.

ADEQ proposes to amend the monitoring requirements for radiochemicals to clarify that monitoring for gross alpha particle radioactivity may be substituted for radium-226 and radium-228 monitoring. This proposed revision will conform the rule to be consistent with 40 CFR 141.26(a)(1)(i). Gross alpha particle radioactivity monitoring may be substituted provided that the gross alpha particle radioactivity measurement does not exceed 5 pCi/L. If a gross alpha particle radioactivity measurement exceeds 5 pCi/L, then a water supplier must have the same or an equivalent sample analyzed for radium-226. If the concentration of radium-226 in the sample exceeds 3 pCi/L, then the water supplier must have the same sample analyzed for radium-228 [See 40 CFR 141.26(a)(1)(ii)]. If a gross alpha particle activity measurement exceeds 15 pCi/L, then a water supplier must have the same sample analyzed for uranium to determine compliance with the maximum contaminant level for gross alpha particle radioactivity. The currently effective rule does not clearly state that monitoring for gross alpha particle radioactivity may be substituted for radium-226 and radium-228 monitoring. Also, the currently effective ADEQ rule requires follow-up monitoring for *combined* radium-226 and radium-228 when a gross alpha particle radioactivity measurement exceeds 5 pCi/L. Follow-up monitoring for combined radium-226 and radium-228 is inconsistent with 40 CFR 141.26(a)(1)(ii).

The proposed rule is reorganized to clarify what the increased monitoring requirements are when a maximum contaminant level for a radiochemical is exceeded [See R18-4-217(C)]. The proposed rule clearly states the circumstances under which ADEQ may order increased monitoring for radiochemicals [See R18-4-217(D)]. It also clearly identifies the requirements that a water supplier must meet to qualify for reduced radiochemical monitoring [See R18-4-217(E)]. Finally, ADEQ is proposing to add the detection limits for radiochemicals to Appendix B. The proposed detection limits are taken from the National Primary Drinking Water Regulation which prescribes analytical methods for radioactivity [See 40 CFR 141.25(c)].

Amendment of the Additives Rule [R18-4-119]

ADEQ proposes to amend the additives rule to conform the rule to recently enacted state legislation, eliminate obsolete cross-references, and update incorporations by reference. In the Second Regular Session of the 42nd Legislature, the Arizona legislature enacted Senate Bill 1275 into law. S.B. 1275 includes A.R.S. § 49-353.01 which requires that the Director of ADEQ adopt rules which prescribe minimum standards for equipment and materials which come into contact with drinking water that is sold or distributed to the public. The law states that chemicals, materials, or equipment that have been certified by the National Sanitation Foundation [NSF] meet the requirements of S.B. 1275. The law also provides that in those instances where chemicals, materials, and equipment that come into contact with drinking water are essential to the design, construction, or operation of a drinking water system and they have not been NSF-certified or where they may be NSF-certified but are available only from one source, then the state drinking water rules must allow the use of alternatives. A.R.S. § 353.01 lists the alternatives that must be included in the rules. These are:

1. Products composed entirely of ingredients determined by the U.S. Environmental Protection Agency, the Food and Drug Administration, or other federal agencies as appropriate for addition to potable water or aqueous food;
2. Products composed entirely of ingredients listed in the National Academy of Sciences "Water Chemicals Codex;"
3. Products that are consistent with the specifications of the American Water Works Association;
4. Products that are designed for use in drinking water systems that are consistent with the specifications of the American Society for Testing and Materials; and
5. Products that have been used historically or which are in use in drinking water systems, consistent with standard practice, which have not been demonstrated during past applications in the United States to contribute to water contamination.

ADEQ proposes to amend the additives rule by adding a new subsection D which will allow the use of the alternatives mandated by S.B. 1275.

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ADEQ also proposes to amend R18-4-119(A) to eliminate an obsolete reference to a January 1, 1993 compliance date. The currently effective rule states that: "[a]ll products added directly to drinking water during production or treatment *after January 1, 1993* shall conform to National Sanitation Foundation Standard 60.... [emphasis added]" The reference to January 1, 1993 is unnecessary and should be deleted.

ADEQ proposes to amend R18-4-119(B) for similar reasons. The currently effective rule states that: "[m]aterials or products *used or installed after January 1, 1993*, that come into contact with drinking water or with drinking water treatment chemicals shall conform to National Foundation Standard 61." During the last rulemaking to revise the drinking water rules [i.e., revisions effective April 28, 1995], ADEQ received a public comment on the additives rule which recommended the deletion of the word, "used," in the phrase italicized above. The commenter pointed out that materials or products that were installed prior to January 1, 1993 but used after that date would have to be removed if they did not conform to NSF Standard 61. The commenter pointed out that this regulatory requirement could impose an enormous economic burden on public water systems to retrofit their systems with NSF-certified materials or products. For this reason, ADEQ agreed that the word "used" should be deleted from R18-4-119(B). However, for reasons related to Attorney General certification of the drinking water rules during the last rulemaking in 1995, ADEQ was unable to make this revision. ADEQ proposes to revise the first sentence in R18-4-119(B) by deleting the word, "used." The proposed rule states: "materials or products installed after

January 1, 1993, that come into contact with drinking water or drinking water chemicals shall conform to National Foundation Standard 61...."

Finally, ADEQ proposes to update the incorporations by reference of NSF Standards 60 and 61. The currently effective rule incorporates NSF Standards 60 and 61, amended as of October, 1988. These incorporations by reference should be updated because NSF Standard 60 was most recently revised in May, 1996. NSF Standard 61 was most recently amended in January, 1995.

Repeal of the Special Monitoring Requirements for Water Corrosivity Characteristics

EPA has repealed the special monitoring requirements for water corrosivity characteristics [See 40 CFR 141.42 and 59 FR 62463-64 (December 5, 1994)]. With the EPA repeal of the special monitoring requirements for water corrosivity characteristics, 40 CFR 141.42 requires only that community water systems identify whether certain construction materials are present in their drinking water distribution systems and report that information to the state. This reporting requirement is found in the currently effective rule at R18-4-403(E). ADEQ proposes to repeal the special monitoring requirements for water corrosivity that are found currently in

R18-4-403 and relocate the remaining reporting requirement to R18-4-104(T).

Clarification of Sample Compositing Requirements for Vinyl Chloride and PCBs

Special monitoring requirements apply to vinyl chloride. Under R18-4-213, a community water system or nontransient, noncommunity water system must conduct monitoring for vinyl chloride at a sampling point only if the public water system detects the presence of certain volatile organic chemicals [VOCs] at a sampling point. Since monitoring for vinyl chloride is conducted at a sampling point only when triggered by a detection of another specified VOC, sample compositing should not be allowed. ADEQ proposes to amend the sample compositing rule at R18-4-219(e)(3) to clarify that compositing of vinyl chloride samples is prohibited.

There are similar special monitoring requirements for polychlorinated biphenyls [PCBs]. The proposed rule permits the use of certain analytical methods, EPA Method 505 or EPA Method 508, to screen for the presence of PCBs in a sample. If a water supplier chooses to use one of these screening methods, the sample must be screened for each of the specific Aroclors that are listed for PCBs in Appendix B. A laboratory which is conducting the analysis using one of the screening methods must meet the detection limits listed in Appendix B for each of the Aroclors. Detecting any of the Aroclors above their respective detection limit requires that the sample be analyzed and quantitated for decachlorobiphenyl using EPA Method 508A. Samples which have been composited cannot be screened using EPA Methods 505 or 508. Composite samples must be analyzed using EPA Method 508A. ADEQ proposes to revise the sample compositing rule at R18-4-219(E)(4) and Appendix B to make this clarification.

Reporting Limits

ADEQ proposes to add a new subsection S to the general reporting requirements that are prescribed in R18-4-104.

ADEQ proposes to establish limits on the reporting of nondetections in analytical results that are submitted to ADEQ. Reporting limits on nondetections are necessary because, without them, a water supplier may submit compliance data which indicates that a regulated contaminant has not been detected in a sample, but the "nondetect" concentration is unacceptably high. If nondetections are reported at concentrations that exceed maximum contaminant levels or other regulatory trigger levels, ADEQ cannot determine compliance with the drinking water rules. The proposed rule states that water suppliers are prohibited from submitting compliance data which does not meet prescribed reporting limits for nondetections. Water suppliers who submit analytical results which do not comply with the prescribed reporting limits will be required to resample or have the laboratory analysis of the sample done again.

Water suppliers and laboratories submit analytical results and frequently report that contaminants have not been detected in drinking water samples. However, the laboratories which do analyses of drinking water samples are not required to achieve certain levels of precision in their analyses. Consequently, analytical results that are submitted to ADEQ may not be usable for compliance purposes. Because there are no reporting limits for nondetections prescribed in rule, "nondetects" may be reported at concentrations that are above maximum contaminant levels or regulatory trigger levels for increased monitoring or public notice.

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For example, all community water systems must conduct monitoring to determine whether the drinking water they provide complies with the maximum contaminant levels for synthetic organic chemicals. The monitoring requirements for synthetic organic chemicals state that if a community water system detects a synthetic organic chemical in a concentration that is greater than or equal to 50% of the MCL for a synthetic organic chemical, then the community water system must conduct more frequent monitoring for that contaminant. Under the currently effective rules, a testing laboratory may report that a synthetic organic chemical is not detected, but the nondetection may be reported at a concentration that exceeds the maximum contaminant level or the trigger level for increased monitoring. The following hypothetical illustrates this problem:

The Responsible Water Company is a community water system which is required to conduct monitoring to determine whether there are any synthetic organic chemicals in the drinking water that it provides to its customers. One of the synthetic organic chemicals that the Responsible Water Company must monitor for is alachlor. The maximum contaminant level for alachlor is 0.002 mg/L and the concentration which triggers increased monitoring is 0.001 mg/L [i.e., 50% of the MCL]. The Responsible Water Company takes its drinking water sample to the Accuracy Plus Testing Laboratory which is licensed by the Arizona Department of Health Services [ADHS] to conduct analyses of drinking water samples for the presence of alachlor. There are no state requirements that the Accuracy Plus Testing Laboratory demonstrate that it can achieve certain detection limits in order to obtain or keep its license to conduct analyses of drinking water samples for alachlor. The Accuracy Plus Testing Laboratory conducts the analysis of the drinking water sample using an ADHS-approved method and reports the analytical results to ADEQ. Because there are no reporting limits for nondetection in the rule, the Accuracy Plus Testing Laboratory reports that alachlor was not detected in the sample and that the concentration of alachlor in the sample is less than 0.003 mg/L [For purposes of this hypothetical, assume that 0.003 mg/L represents the limit of detection for alachlor that the Accuracy Plus Testing Laboratory can achieve with its equipment]. Unfortunately, ADEQ cannot determine whether the drinking water provided by the Responsible Water Company complies with the MCL for alachlor [0.002 mg/L] or whether the Responsible Water Company should increase the frequency of monitoring for alachlor [i.e., the trigger level is 0.001 mg/L] from this analytical result. ADEQ cannot determine compliance because two equally valid conclusions can be drawn from a "nondetect" that is reported at "<0.003 mg/L." First, it is possible that there is no alachlor in the sample. The Accuracy Plus Testing Laboratory reports that alachlor was *not detected* in the sample. The second possibility is that alachlor is present in the drinking water sample, but in a concentration that is less than 0.003 mg/L. It is possible that alachlor is present in the sample in a concentration that exceeds the MCL or the trigger level for increased monitoring. Another laboratory may be able to detect alachlor in drinking water samples with greater precision [e.g., the Really Good Testing Laboratory can detect alachlor in concentrations as low as 0.001 mg/L]. However, there is nothing in the drinking water rules which requires that the Accuracy Plus Testing Laboratory achieve such precision. The proposed subsection S addresses the significant reporting problem illustrated by the hypothetical case. Subsection S requires that the analytical results of compliance samples be reported by water suppliers with minimum levels of precision so ADEQ can determine compliance. In particular, subsection S prohibits the reporting of nondetections at concentrations that are below MCLs and regulatory trigger levels. Subsection S prescribes the reporting limits for nondetection so that compliance data that is reported to ADEQ can be used for compliance determinations. The proposed rule prohibits the submittal of compliance data which includes nondetections that are reported at unacceptably high concentrations.

Clarification of Increased Monitoring Requirements for Nitrate and Nitrite

The rule which prescribes monitoring requirements for nitrate, R18-4-208, includes a provision which requires increased monitoring if nitrate is detected at a groundwater sampling point in a concentration which is equal to or greater than 5 mg/L. R18-4-208(F) requires an increase in monitoring frequency from annually to quarterly. If increased monitoring is triggered at a sampling point, then a public water system must continue quarterly monitoring until the analytical results from four consecutive quarterly samples demonstrate that the concentration of nitrate in the water is less than the maximum contaminant level of 10 mg/L. If the quarterly monitoring results demonstrate that the concentration of nitrate is reliably and consistently below the maximum contaminant level, then the Department may reduce the monitoring frequency at the sampling point from quarterly to annually. ADEQ proposes to add a sentence to R18-4-208(F) to clarify that once a public water system is triggered into increased monitoring and the quarterly monitoring results demonstrate that the concentration of nitrate is reliably and consistently below the maximum contaminant level [i.e., less than 10 mg/L], a subsequent detection of nitrate at that sampling point in a concentration which is greater than or equal to 5 mg/L and less than or equal to 10 mg/L will not "retrigger" increased monitoring. ADEQ is proposing a similar clarification of the increased monitoring requirements for nitrite at R18-4-209(G).

Clarification of MCL for Polychlorinated Biphenyls as Decachlorobiphenyl

The National Primary Drinking Water Regulations state that compliance with the maximum contaminant level for polychlorinated biphenyls [PCBs] shall be determined based upon the quantitative results of analyses using EPA Method 508A [See 40 CFR 141.24(h)(13)(iii)]. EPA Method 508A is used to quantitate PCBs as decachlorobiphenyl. ADEQ proposes to amend R18-4-215 to clarify that the maximum contaminant level for PCBs is expressed as decachlorobiphenyl.

Identification of Compliance Samples

ADEQ proposes to amend R18-4-109 to clarify that a water supplier must identify a sample as a compliance sample at the time the sample is submitted to a drinking water testing laboratory for analysis.

5. A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision of this state:

Not applicable

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6. The preliminary summary of the economic, small business, and consumer impact:

Under A.R.S. § 41-1055(D), an agency is not required to prepare an economic, small business, and consumer impact statement if the rulemaking decreases monitoring, record keeping, or reporting burdens on agencies, political subdivisions, businesses, or persons unless the agency determines that the increased costs of implementation or enforcement of the rules may equal or exceed the reduction in burdens.

Most of the changes proposed by ADEQ are nonsubstantive changes to clarify the rules, eliminate unnecessary language, correct incorrect cross-references, and to update incorporations by reference. These nonsubstantive revisions will have no economic, small business, or consumer impact. A few of the proposed revisions to the drinking water rules are substantive, but they reduce monitoring, recordkeeping, or reporting burdens for public water systems. The proposed rules will not increase the costs of implementation or enforcement of the drinking

water rules. Therefore, ADEQ has concluded that an economic, small business and consumer impact statement is not required for this rulemaking.

The proposed repeal of the maximum contaminant level for nickel reduces the number of regulated inorganic chemicals. However, the currently effective monitoring requirements for nickel remain largely unchanged. Community water systems and non-transient, noncommunity water systems will still have to conduct monitoring for nickel. However, the repeal of the maximum contaminant level for nickel will eliminate the possibility of increased monitoring due to an exceedance of the MCL for nickel. Under the currently effective rules, a public water system must increase the monitoring frequency for nickel if the maximum contaminant level is exceeded at a sampling point. The special monitoring requirements for nickel that are being proposed at R18-4-403 are identical to the nickel monitoring requirements prescribed in R18-4-206 in the currently effective rules, except that the proposed rule does not include increased monitoring provisions. The special monitoring requirements for nickel prescribed in R18-4-403 are less stringent than those found in the currently effective rules and represent a reduction in the monitoring burden for community water systems and nontransient, noncommunity water systems.

The limitation of the applicability of the maximum contaminant level for arsenic to community water systems will reduce monitoring requirements for nontransient, noncommunity water systems which must conduct monitoring for

arsenic under the currently effective rules. This proposed rule change will reduce monitoring requirements for approximately 230 nontransient, noncommunity water systems.

The proposed revisions to the rules which will have the most significant economic impact are the proposed revisions to the monitoring requirements for radiochemicals. The proposed change from source monitoring to point-of-entry monitoring for radiochemicals will reduce monitoring requirements for community water systems with multiple sources of water that are combined before the water enters the distribution system. For example, the public water system for the City of Tucson has 171 sources of water and 126 points-of-entry. The adoption of the proposed point-of-entry monitoring approach for radiochemicals would result in a reduction of 45 sampling points and a corresponding decrease in radiochemical monitoring costs. Similarly, the City of Scottsdale would see a reduction of 9 sampling points. In a brief survey of approximately 70 community water systems by ADEQ, approximately half of those systems will be able to reduce their radiochemical monitoring by 2 to 3 sampling points. The adoption of the proposed point-of-entry monitoring approach will not cause an increase in radiochemical monitoring costs for any public water system, it can only reduce monitoring burdens.

The proposed revisions to the additives rule provide regulatory flexibility because they allow the use of alternative materials or products that come into contact with drinking water when National Sanitation Foundation- certified materials and products are unavailable or when those materials or products are available only from one source. This provision will give water suppliers the flexibility to use cost-effective alternative materials and products that are commercially available in the water works industry when there is only one supplier of an NSF- certified material or product. The amended rule introduces competition into the additives rule by allowing the

use of alternative materials and products. Additional competition should result in lower costs to public water systems.

The repeal of the special monitoring requirements for water corrosivity characteristics will reduce monitoring burdens for community water systems. The proposed repeal of R18-4-403 eliminates a provision which requires that a community water system conduct one-time round of monitoring to determine water corrosivity characteristics.

The establishment of reporting limits for nondetection in rule is a codification of an existing compliance data policy that is being implemented currently by the ADEQ Drinking Water Section in cooperation with the Office of Laboratory Licensure, Certification, and Training of the Arizona Department of Health Services [ADHS]. ADHS has informed the drinking water testing laboratories of the currently effective reporting limits policy through the publication of ADHS Information Update #28 [June 10, 1996]. ADEQ also published the reporting limits policy in the ADEQ Drinking Water Section's newsletter, Splash [See Vol. 1, No. 2, Summer, 1996]. The proposed rule clarifies reporting requirements that are implied by the establishment of maximum contaminant levels and other regulatory trigger levels in the currently effective drinking water rules. Reporting limits on nondetections are necessary adjuncts to the establishment of any MCL or regulatory trigger. Without such reporting limits, ADEQ cannot determine compliance with the MCLs or regulatory triggers. The codification of the reporting limits policy does not establish new reporting requirements or increase reporting burdens for drinking water testing laboratories and water suppliers. The proposed rule merely clarifies ADEQ's currently effective compliance data policy.

The clarification of sample compositing requirements and the other minor technical amendments to the drinking water rules that are proposed in this rulemaking will have no economic impact.

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7. The name and address of agency personnel with whom persons may communicate regarding the accuracy of the economic, small business, and consumer impact statement:
Not applicable

8. The time, place, and nature of the proceedings for the adoption, amendment, or repeal of the rule:
Oral proceedings to take public comment on the proposed rules are scheduled as follows:

Written comments on the proposed rules may be submitted to the Department. Written comments must be received by the Department by close of business or postmarked on February 28, 1997. Written comments should be addressed to:

Mr. Steven Pawlowski
Department of Environmental Quality
3033 N. Central Avenue
Phoenix, Arizona 85012

9. Any other matters prescribed by statute that are applicable to the specific agency or to any specific rule or class of rules:
Not applicable

10. Incorporation by reference and their location in the rules:
National Standard Foundation Standards 60 and 61 in R18-4-119.

11. The full text of the rules follows:

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 4. DEPARTMENT OF ENVIRONMENTAL QUALITY
SAFE DRINKING WATER

ARTICLE 1. GENERAL REQUIREMENTS

Section

- R18-4-101. Definitions
R18-4-102. Applicability
R18-4-103. ~~General~~ Recordkeeping Requirements
R18-4-104. Reporting Requirements
R18-4-105. ~~General~~ Public Notification Requirements
R18-4-106. Use of Approved Analytical Methods
R18-4-107. Use of Licensed Laboratories
R18-4-108. Recodified
R18-4-109. Sample Collection, Preservation, and Transportation
R18-4-110. Variances
R18-4-111. Exemptions
R18-4-112. Exclusions
R18-4-113. Consecutive Public Water Systems
R18-4-114. Certified Operators
R18-4-115. Backflow Prevention
R18-4-116. Emergency Operations Plans
R18-4-117. Unsafe Supplies
R18-4-118. Sanitary Surveys
R18-4-119. Additives
R18-4-120. Monitoring and Sampling by the Department
R18-4-121. Enforcement
R18-4-122. Entry and Inspection of Public and Semipublic Water Systems
R18-4-123. Vending Machines
R18-4-124. Operation and Maintenance
R18-4-125. Hauled Water

ARTICLE 2. MAXIMUM CONTAMINANT LEVELS AND-MONITORING REQUIREMENTS

Section

- R18-4-201. Maximum Contaminant Levels: Public Water Systems Affected
R18-4-202. Total Coliform; MCLs and Monitoring Requirements
R18-4-203. Total Coliform; Special Events

- R18-4-204. Turbidity; Interim MCLs and Monitoring Requirements
R18-4-205. Inorganic Chemicals; MCLs
R18-4-206. Monitoring Requirements for Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cyanide, Fluoride, Mercury, ~~Nickel~~, Selenium, and Thallium
R18-4-207. Asbestos; Monitoring Requirements
R18-4-208. Nitrate; Monitoring Requirements
R18-4-209. Nitrite; Monitoring Requirements
R18-4-210. Fluoride; Special Public Notice
R18-4-211. Volatile Organic Chemicals; MCLs
R18-4-212. Volatile Organic Chemicals; Monitoring Requirements
R18-4-213. Vinyl Chloride; Monitoring Requirements
R18-4-214. Total Trihalomethanes; MCL and Monitoring Requirements
R18-4-215. Synthetic Organic Chemicals; MCLs
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ARTICLE 1. GENERAL REQUIREMENTS

R18-4-101. Definitions

The terms in this Chapter have the following meanings:

1. "Action level" means a concentration of 0.015 mg/L for lead or 1.3 mg/L for copper.
2. "Air-gap separation" means a physical separation between the discharge end of a supply pipe and the top rim of its receiving vessel, which has a separation distance equal to at least one inch or twice the diameter of the supply pipe, whichever is greater.
3. "A.W.W.A. standard" means an official standard developed and approved by the American Water Works Association (A.W.W.A.). "A.R.S." means Arizona Revised Statutes.
4. "Backflow" means a reverse flow condition, which causes water or mixtures of water and other liquids, gases, or substances to flow back into the distribution system. Backflow can be created by a difference in water pressure (backpressure), a vacuum or partial vacuum (backsiphonage), or a combination of both.
5. "Backflow-prevention assembly" means any assembly used to prevent backflow.
6. "BAT" means best available technology.
7. "Best available technology" means a technology, treatment technique, or other means which has been identified by the U.S. Environmental Protection Agency (EPA) as being the best available for removing or reducing the con-

centration of a contaminant in water, taking costs into consideration, after examination for efficacy under field conditions and not solely under laboratory conditions.

8. "Certified operator" means a person who holds an operator certificate issued by the Department to operate a water treatment plant or a distribution system.
9. "Coagulation" means a treatment process which uses coagulant chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into flocs.
10. "Community water system" means a public water system which serves 15 or more service connections used by year-round residents or which serves 25 or more year-round residents.
11. "Compliance cycle" means a nine-calendar-year time frame during which a public water system is required to monitor. Each compliance cycle consists of three compliance periods. ~~The first compliance cycle begins January 1, 1993, and ends December 31, 2001. The second compliance cycle begins January 1, 2002, and ends December 31, 2010. The third compliance cycle begins January 1, 2011, and ends December 31, 2019.~~
12. "Compliance period" means a three-calendar-year time frame within a compliance cycle. ~~Within the first compliance cycle, the first compliance period begins January 1, 1993, and ends December 31, 1995. The second compliance period begins January 1, 1996, and ends December 31, 1998. The third compliance period begins January 1, 1999, and ends December 31, 2001.~~
13. "Consecutive public water system" means a public water system which obtains all of its water from another public water system that is regulated by the Department.
14. "Contaminant" means any physical, chemical, biological, microbiological, or radiological substance in water.
15. "Conventional filtration" means a series of treatment processes, including coagulation, flocculation, sedimentation, and filtration that result in substantial particulate removal.
16. "Corrosion inhibitor" means a substance capable of reducing the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.
17. "Cross connection" means a physical connection between a public water system and any source of water or other substance which may lead to contamination of the water provided by the public water system through backflow.
18. "CWS" means community water system.
19. "Department" means the Arizona Department of Environmental Quality.
20. "Detected" means measured in the laboratory at a concentration which is at or above the method detection limit for a given contaminant.
21. "Diatomaceous earth filtration" means a treatment process that results in substantial particulate removal in which a pre-coat cake of diatomaceous earth filter media is deposited on a support membrane known as a septum and, while the water is filtered through the cake on the septum, additional filter media known as body feed are continuously added to the feed water to maintain the permeability of the filter cake.

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22. "Direct filtration" means a series of treatment processes, including coagulation and filtration but excluding sedimentation, that result in substantial particulate removal.
23. "Disinfectant" means any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, ozone, or any equivalent agent or process such as ultraviolet light, that is intended to kill or inactivate pathogenic organisms.
24. "Disinfection" means a treatment process that is intended to kill or inactivate pathogenic organisms in water by oxidants, ultraviolet light, or equivalent agents.
25. "Distribution system" means the pipelines, appurtenances, devices, and facilities of a public water system which conduct water from a source or water treatment plant to persons served by the system.
26. "Domestic or other non-distribution system plumbing problem" means a total coliform contamination problem in a public water system with more than one service connection that is limited to a specific service connection from which a total coliform-positive sample is taken.
27. "Dose equivalent" means the product of the absorbed dose from ionizing radiation and such factors as account for differences in biological effectiveness due to the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements.
28. "Double check valve assembly" means a backflow-prevention assembly that contains at least two independently acting check valves with tightly closing shut-off valves on each end of the assembly and properly located test cocks.
29. "Effective corrosion inhibitor residual" means a concentration of a corrosion inhibitor that is sufficient to form a passivating film on the interior walls of a pipe.
30. "Exclusion" means a waiver from a requirement ~~established by~~ of this Chapter that is not a requirement contained in the National Primary Drinking Water Regulations which may be granted pursuant to R18-4-112.
31. "Exemption" means the allowance of a temporary deviation from a maximum contaminant level or a treatment technique requirement ~~established by~~ of this Chapter which may be granted pursuant to R18-4-111.
32. "Filtration" means a treatment process for removing particulate matter from water by passage through porous media.
33. "First-draw sample" means a one-liter sample of tap water, collected in accordance with R18-4-310(D) that has been standing in plumbing pipes for at least ~~six~~ 6 hours and is collected without flushing the tap.
34. "Flocculation" means a treatment process to enhance agglomeration or collection of smaller floc particles into larger and more easily settleable particles through gentle stirring by hydraulic or mechanical means.
35. "GAC" means granular activated carbon.
36. "GC" means gas chromatography.
37. "GC/MS" means gas chromatography/mass spectrometry.
38. "Gross alpha particle activity" means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.
39. "Gross beta particle activity" means the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.
40. "Groundwater system" means a public water system that is supplied solely by groundwater that is not under the direct influence of surface water.
41. "Groundwater under the direct influence of surface water" means any water beneath the surface of the ground with:
 - a. A significant occurrence of insects or other macroorganisms, algae, large diameter pathogens such as *Giardia lamblia*, or total coliform; or
 - b. Significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions.
42. "Halogenated" means treated or mixed with chlorine, bromine, or iodine.
43. "HPC" means heterotrophic plate count.
44. "Initial compliance period" means the ~~first, full three-year~~ compliance period in a compliance cycle during which a public water system conducts initial monitoring.
45. "Initial monitoring year" means the calendar year designated by the Department within a compliance period in which a public water system conducts initial monitoring.
- 45-46. "Large water system" means a public water system that serves more than 50,000 persons.
- 46-47. "Lead-free" means that the pipe, solder, or flux used in the installation or repair of any public water system or in any residential or nonresidential facility which provides water for human consumption and which is connected to such public water system meets the following criteria:
 - a. All solders and flux contain not more than 0.2 % lead;
 - b. All pipes and pipe fittings contain not more than 8.0 % lead.
- 47-48. "Lead service line" means a service line made of lead which connects a water main to a building inlet and any lead pigtail, gooseneck, or fitting which is connected to the service line.
- 48-49. "Log" means, in terms of removal or inactivation of *Giardia lamblia* cysts or viruses, the following:
 - a. "One-log" is 90 %.
 - b. "Two-log" is 99 %.
 - c. "Three-log" is 99.9 %.
 - d. "Four-log" is 99.99 %.
- 49-50. "Man-made beta particle and photon emitters" means all radionuclides emitting beta particles or photons, except the daughter products of Thorium-232, Uranium-235, and Uranium-238, listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," Handbook 69, U.S. Department of Commerce, National Bureau of Standards, amended as of August, 1963) (and no future editions), which is incorporated by reference and on file with the Office of the Secretary of State and the Department.
- 50-51. "Maximum contaminant level" means the maximum permissible level for a contaminant in water which is delivered to any person who is served by a public water system.
- 51-52. "Maximum total trihalomethane potential" means the maximum concentration of total trihalomethanes produced in water containing a disinfectant residual after ~~seven~~ 7 days at a temperature of 25° C or above.
- 52-53. "MCL" means maximum contaminant level.
- 53-54. "MFL" means million fibers per liter greater than ten microns in length.
- 54-55. "Medium water system" means a public water system that serves more than 3,300 persons and 50,000 or fewer persons.
- 55-56. "Millirem" means 1/1000 of a rem.

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- 56-57. "MTP" means maximum total trihalomethane potential.
- 57-58. "Nephelometric turbidity unit" means the unit of measure for turbidity. Turbidity is a measure of light scatter or absorption caused by suspended or colloidal matter. Turbidity is measured as an indicator of treatment effectiveness, specifically for clarification and filtration processes.
- 58-59. "Noncommunity water system" means a public water system that is not a community water system. A noncommunity water system is either a nontransient, noncommunity water system or a transient, noncommunity water system.
- 59-60. "Nontransient, noncommunity water system" means a public water system which:
- Serves 15 or more service connections that are used by the same persons for at least six 6 months per year; or
 - Serves the same 25 or more persons for at least six 6 months per year.
- 60-61. "NTNCWS" means nontransient, noncommunity water system.
- 61-62. "NTU" means nephelometric turbidity unit.
- 62-63. "Optimal corrosion control treatment" means the corrosion control treatment that minimizes lead and copper concentrations at the tap without violating any rule prescribed in this Chapter.
- 63-64. "OX" means chlorine or ozone oxidation.
- 64-65. "pCi" means picocurie.
- 65-66. "Picocurie" means the quantity of radioactive material producing 2.22 nuclear transformations per minute.
- 66-67. "Point-of-entry into the distribution system" means the point at which water is discharged into the distribution system from a well, storage tank, pressure tank, or water treatment plant.
- 67-68. "Point-of-entry treatment device" means a device which applies physical or chemical treatment to water entering a user's premises for the purpose of reducing contaminants in the water that is distributed throughout the premises.
- 68-69. "Point-of-use treatment device" means a device which applies physical or chemical treatment to the water flowing to a single tap for the purpose of reducing contaminants in water at that one tap.
- 69-70. "Pressure vacuum breaker assembly" means a backflow-prevention assembly that contains one or two independently operated, internally loaded check valves; an internally operated air-inlet valve located on the discharge side of the check valve with tightly closing shut-off valves on each end of the check valve assembly; and properly located test cocks.
- 70-71. "Private agricultural water system" means a water system which:
- Is owned and operated as part of an agricultural enterprise;
 - Has less than 15 service connections or serves less than 25 persons on the real property of the agricultural enterprise;
 - Serves only the owner, employees, and their dependents residing on the real property of the agricultural enterprise;
 - Does not sell water for domestic purposes; and
 - Does not hold out, offer, or provide water to the public at large.
- 71-72. "PTA" means packed tower aeration.
- 72-73. "Public water system" means a system for the distribution of water to the public for human consumption which serves 15 or more service connections or which serves an average of at least 25 persons per day for at least 60 days a year. A public water system includes:
- Any collection, treatment, storage, and distribution facilities under the control of the operator of such system water supplier and used in connection with such the system; and
 - Any collection or pretreatment storage facilities not under such the control of the water supplier which are used with such the system.
- A public water system is either a community water system; a nontransient, noncommunity water system; or a transient, noncommunity water system.
- 73-74. "Reduced pressure principle backflow-prevention assembly" means a backflow-prevention assembly which includes not less than two check valves; an automatically operated, differential relief valve located between the two check valves with tightly closing shut-off valves on each end of the check valve assembly; and properly located test cocks.
- 74-75. "Rem" means the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system.
- 75-76. "Repeat compliance period" means any subsequent compliance period after the initial compliance period.
- 76-77. "Residual disinfectant concentration" means the concentration of disinfectant measured in mg/L in a representative sample of water.
- 77-78. "Sanitary survey" means an on-site review of the water source, facilities, equipment, operation, and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation, and maintenance for producing and distributing safe drinking water.
- 78-79. "Sedimentation" means a treatment process which holds water in a low-flow condition before filtration and which removes solids by gravity or separation.
- 79-80. "Semipublic water system" means a water system with at least four 4 service connections and less than 15 service connections which:
- Serves an average of less than 25 persons per day; or
 - Serves an average of 25 or more persons a day but for less than 60 days a year.
- 80-81. "Service connection" means a location at the meter, or in the absence of a meter, at the curbside or at the building inlet.
- 81-82. "Service line" means the water line which runs from the corporation stop at a water main to the building inlet, including any pigtail, gooseneck, or fitting.
- 82-83. "Service line sample" means a one-liter sample of water, collected in accordance with R18-4-310(D), that has been standing for at least six 6 hours in a service line.
- 83-84. "Single-family structure" means a building constructed as a single-family residence that is currently used as a residence or as a place of business.
- 84-85. "Slow sand filtration" means a treatment process which involves the passage of raw water through a bed of sand at low velocity, generally less than 0.4 m/h, that results in substantial particulate removal by physical and biological mechanisms.
- 85-86. "Small water system" means a public water system that serves 3,300 or fewer persons.
- 86-87. "SOC" means synthetic organic chemical.
- 87-88. "Source" means any body of water above or below the ground from which a water supply is obtained, including any well, spring, or surface water.

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- 88-89. "Standard sample" means the aliquot of finished drinking water that is examined for the presence of coliform bacteria. The standard sample volume is 100 milliliters.
- 89-90. "Surface water" means any source that is exposed to the unenclosed atmosphere and that is subject to surface runoff.
- 90-91. "Surface water system" means a public water system that uses surface water or groundwater under the direct influence of surface water, in whole or in part, as a source.
- 91-92. "Total trihalomethanes" means the sum of the concentrations of the following trihalomethane compounds: trichloromethane (chloroform), dibromochloromethane, bromo-dichloromethane and tribromomethane (bromoform).
- 92-93. "Transient, noncommunity water system" means a public water system which:
- a. Serves 15 or more service connections but which does not serve 15 service connections used by the same persons for more than six 6 months per year; or
 - b. Serves an average of at least 25 persons per day for at least 60 days per year but which does not serve the same 25 persons for more than six 6 months per year.
- 93-94. "Treatment" means to intentionally change the quality of water by a physical, chemical, or biological process.
- 94-95. "Trihalomethane" means one of the family of organic compounds, named as derivatives of methane, wherein three of the four hydrogen atoms in methane are substituted by a halogen atom in the molecular structure.
- 95-96. "TTHM" means total trihalomethanes.
- 96-97. "User facilities" means the aggregate of all facilities (for example, buildings, appurtenances, equipment, manufacturing and storage facilities, and water distribution pipes) on the user's side of the service connection.
- 97-98. "Variance" means the allowance of a deviation from either a maximum contaminant level or a treatment technique which may be granted pursuant to R18-4-110.
- 98-99. "Virus" means an enteric virus which is infectious to humans by waterborne transmission.
- 99-100. "VOC" means volatile organic chemical.
- 100-101. "Water main" means any pipe which is used to distribute potable water which serves more than one property or residence and is exterior to buildings.
- 101-102. "Water supplier" means a person who owns or operates ~~who supervises or directs the operation of~~ a public water system.
- 102-103. "Waterborne disease outbreak" means the occurrence of acute infectious illness which is epidemiologically associated with the ingestion of water from a public water system.
- 103-104. "Water system" means:
- a. Any collection, treatment, storage, and distribution facilities under the control of the ~~operator of such system~~ water supplier and used in connection with ~~such the system~~; and
 - b. Any collection or pretreatment storage facilities not under ~~such the control of the water supplier~~ which are used with ~~such the system~~ for the distribution of water to the public for human consumption or for any of the following purposes: producing, processing, storing, handling, serving, or transporting food or drink and the washing of related utensils, equipment or food contact surfaces; bathing or personal hygiene; or washing clothes. A water system does not include a system which delivers water solely for

irrigation purposes.

- 104-105. "Water treatment plant" means a facility in which the quality of the water is intentionally changed by a physical, chemical, or biological process. A booster chlorination facility which is designed to maintain an effective disinfectant residual in water in the distribution system is not a water treatment plant.

R18-4-102. Applicability

- A. The rules in this Chapter apply to public water systems.
- B. The rules in this Chapter do not apply to semipublic water systems or to private agricultural water systems, unless a health hazard is identified. The Director may take enforcement action to require that a semipublic water system or a private agricultural water system comply with a rule prescribed in this Chapter to safeguard the health of users of the system. ~~The Director shall identify, in writing, the health hazard which provides grounds for initiation of any enforcement action.~~
- C. The rules in this Chapter do not apply to a public water system that meets all of the following criteria:
 1. The public water system consists only of distribution and storage facilities and does not have any collection or treatment facilities;
 2. The public water system obtains all of its water from, but is not owned or operated by, another public water system that is regulated under this Chapter;
 3. The public water system does not sell^a water to any person; and
 4. The public water system is not a carrier which conveys passengers in interstate commerce.
- D. ~~The rules in this Chapter do not apply to a public water system for a mobile home park which meets all of the following criteria:~~
 1. ~~The public water system for the mobile home park consists only of distribution and storage facilities and does not have any collection or treatment facilities;~~
 2. ~~The public water system for the mobile home park obtains all of its water from, but is not owned or operated by, another public water system that is regulated under this Chapter;~~
 3. ~~The public water system for the mobile home park does not sell water to any person. For purposes of this subsection, submetering by a mobile home park to determine the quantity of water used by individual park tenants shall not be considered to be selling water, provided the submetering is for purposes of water conservation.~~
 - a. ~~Submetering by a mobile home park to determine the quantity of water used by individual park tenants shall not be considered to be selling water, provided the submetering is for purposes of water conservation.~~

R18-4-103. General Recordkeeping Requirements

- A. A water supplier shall retain on the premises of a public water system or at a convenient location near its premises, the following records:
 1. Records of bacteriological analyses, including records of analyses for total coliform, fecal coliform, *Escherichia coli* (*E. coli*), and heterotrophic bacteria. ~~Records of bacteriological analyses, which shall be kept for at least five 5 years.~~
 2. Records of chemical analyses, which shall be kept for at least ~~ten~~ 10 years.
 3. Records of actions taken by the water supplier to correct violations of this Chapter, which shall be kept for at least ~~three~~ 3 years after the last action taken ~~with respect to the particular violation involved; to correct the violation.~~

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4. Records concerning ~~variances or exemptions~~ a variance or exemption granted to the public water system which shall be kept for at least ~~five~~ 5 years after the expiration of ~~such~~ the variance or exemption.
 5. Copies of written reports, summaries, or communications relating to ~~sanitary surveys~~ a sanitary survey of the public water system. ~~Records related to a sanitary survey which shall be kept for at least ten~~ 10 years after completion of the sanitary survey involved.
 6. Any public water system that is subject to the requirements of the lead and copper rules prescribed at R18-4-305 through R18-4-316 shall retain original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, Department determinations, and any other information required by R18-4-305 through R18-4-316. Each public water system shall retain the records for at least 12 years.
 7. A water supplier of a surface water system shall retain the following records for at least ~~ten~~ 10 years:
 - a. Records of turbidity measurements, including the number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in this ~~Section R18-4-302~~ for the filtration technology being used.
 - b. The date and value of any turbidity measurement taken during the month which exceeds ~~five~~ 5 NTUs.
 8. A water supplier of a surface water system shall retain the following records for at least ~~ten~~ 10 years:
 - a. Records of the lowest residual disinfectant concentration (in mg/L) in water entering the distribution system for each day that each water treatment plant is operating;
 - b. Records of the residual disinfectant concentration (in mg/L) in water for each sampling site in the distribution system;
 - c. Records of analyses for heterotrophic bacteria if HPC is measured in lieu of residual disinfectant concentration in the distribution system.
 - B. When records of laboratory analyses are required to be maintained, a water supplier shall keep the actual laboratory reports or copies of Department-approved reporting forms.
- R18-4-104. Reporting Requirements**
- A. Routine monitoring to determine compliance with MCLs: Except as specified in this subsection, a water supplier shall report the results of any test measurement or analysis required by Article 2 of this Chapter to the Department within the first ~~ten~~ 10 days following the month in which the result is received or the first ~~ten~~ 10 days following the end of a required monitoring period prescribed by the Department, whichever is less.
 1. If fecal coliforms or *E. coli* are present in a total coliform-positive sample, a water supplier shall report the positive results to the Department, by telephone or facsimile, as soon as possible but no later than 24 hours after receiving notice of the fecal coliform-positive or *E. coli*-positive test result.
 2. If nitrate is present in a sample in a concentration which exceeds 10 mg/L, then a water supplier shall report the exceedance to the Department within 24 hours of receipt of analytical results which indicate the exceedance.
 3. A water supplier shall report the arithmetic average of analytical results for total trihalomethanes within 30 days of receipt of the last analytical results of the previous quarter.
 - B. MCL violations: Except as specified in this subsection, a water supplier shall report a violation of any maximum contaminant level to the Department within 48 hours of receipt of analytical results which indicate a violation.
 1. A water supplier shall report a violation of a maximum contaminant level for total coliform to the Department, by telephone or facsimile, as soon as possible but no later than 24 hours after receipt of analytical results which indicate a violation.
 2. A water supplier shall report a violation of a maximum contaminant level for nitrate or nitrite to the Department, by telephone or facsimile, as soon as possible but no later than 24 hours after receipt of analytical results which confirm a violation.
 3. A water supplier shall report a violation of an interim maximum contaminant level for turbidity to the Department, by telephone or facsimile, as follows:
 - a. If the arithmetic average of the analytical results of daily samples taken during the month exceeds ~~one~~ 1 NTU, then the water supplier shall report the violation to the Department within the first ~~ten~~ 10 days following the end of the month.
 - b. If the arithmetic average of the results of daily samples taken on ~~two~~ 2 consecutive days exceeds ~~five~~ 5 NTUs, then the water supplier shall report the violation to the Department within 48 hours of receipt of analytical results.
 - C. Filtration reporting requirements: Except as provided in subsection (C)(4), a water supplier of a surface water system which provides filtration shall report the following turbidity measurements to the Department within ~~ten~~ 10 days after the end of each month for each water treatment plant that is operating:
 1. The total number of filtered water turbidity measurements taken during the month;
 2. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits prescribed in R18-4-302 for the filtration technology being used;
 3. The date and value of any turbidity measurement taken during the month that exceeds ~~five~~ 5 NTUs.
 4. If the turbidity of the filtered water exceeds ~~five~~ 5 NTUs, then the water supplier shall report the exceedance to the Department as soon as possible but no later than 24 hours after the exceedance.
 - D. Disinfection reporting requirements: Except as provided in subsection (D)(4), a water supplier of a surface water system which provides disinfection shall report the following information to the Department within ~~ten~~ 10 days after the end of each month for each water treatment plant that is operating:
 1. For each day, the lowest measurement of residual disinfectant concentration in mg/L in water entering the distribution system;
 2. The date and duration of each time period during which the residual disinfectant concentration in water entering the distribution system fell below 0.2 mg/L and the date and time that the Department was notified of the occurrence.
 3. The value of "V" calculated by the formula prescribed in R18-4-303(C)(2) for the current and previous month the surface water system serves water to the public.
 4. If, at any time, the residual disinfectant concentration falls below 0.2 mg/L in water entering the distribution system, the water supplier shall report the occurrence to the Department as soon as possible, but no later than 24 hours after the occurrence. The water supplier also shall report whether the residual disinfectant concentration was restored to at least 0.2 mg/L within ~~four~~ 4 hours.

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- E. Reporting requirements for tap water monitoring for lead and copper under R18-4-310: Each large, medium, or small water system which is required to conduct tap water monitoring for lead and copper pursuant to R18-4-310 shall report to the Department the information specified below for all tap water samples within the first ~~ten~~ 10 days following the end of each ~~six-month~~ monitoring period:
1. The results of all tap water samples for lead and copper including the location of each site and the criteria under which the site was selected for the system's sampling pool;
 2. A certification that each first-draw sample collected by the water system is one-liter in volume and, to the best of their knowledge, has stood motionless in the service line, or in the interior plumbing of a sampling site, for at least ~~six~~ 6 hours;
 3. Where residents collected samples, a certification that each tap sample collected by the residents was taken after the water system informed them of the proper sampling procedures;
 4. The 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period (as calculated in accordance with R18-4-308);
 5. With the exception of initial tap water monitoring for lead and copper, the system shall identify any site which was not sampled during previous monitoring periods, and include an explanation of why sampling sites have changed;
 6. By the applicable date for commencement of tap water monitoring, each CWS which does not complete its sampling pool with Tier 1 sampling sites meeting the targeting criteria specified in R18-4-309(A)(1) shall submit a justification of its selection of Tier 2 or Tier 3 sampling sites to the Department. The justification shall be made on a form that is approved by the Department.
 7. By the applicable date for commencement of tap water monitoring, each NTNCWS which does not complete its sampling pool with Tier 1 sampling sites meeting the targeting criteria specified in R18-4-309(A)(2) shall submit a justification of its selection of Tier 2 sampling sites to the Department. The justification shall be made on a form that is approved by the Department.
 8. By the applicable date for commencement of tap water monitoring, each water system with lead service lines that is not able to locate the number of sites served by such lines required under R18-4-309(A)(4) shall submit a justification to the Department which explains why it was unable to locate a sufficient number of sites served by lead service lines. The justification shall be made on a form that is approved by the Department.
 9. A large, medium, or small water system which collects sampling data in addition to the minimum required by R18-4-309 shall report the analytical results from any additional samples to the Department within ~~ten~~ 10 days following the end of the ~~six-month~~ monitoring period during which the samples are collected.
- F. Reporting requirements for water quality parameter monitoring under R18-4-311: Each large, medium, or small water system which is required to conduct monitoring for water quality parameters pursuant to R18-4-311 shall report the following information to the Department within the first ~~ten~~ 10 days following the end of a ~~six-month~~ monitoring period:
1. The results of all tap water samples for pH, alkalinity, calcium, conductivity, and water temperature and, where applicable, orthophosphate or silica collected pursuant to R18-4-311(B);
 2. The results of all source water quality parameter samples for pH, alkalinity, calcium, conductivity, and, where applicable, orthophosphate or silica, collected at sampling points as prescribed by R18-4-218.
 3. A large, medium, or small water system which collects sampling data on water quality parameters in addition to the minimum required by R18-4-311 shall report the analytical results from any additional water quality parameter samples to the Department within ~~ten~~ 10 days following the end of the ~~six-month~~ monitoring period during which the samples are collected.
- G. Reporting requirements for source water monitoring for lead and copper under R18-4-314: Each large, medium, or small water system which is required to conduct source water monitoring for lead and copper pursuant to R18-4-314 shall report the following information to the Department:
1. A water system shall report the sampling results for all source water samples within the first ~~ten~~ 10 days following the end of each source water monitoring period (~~i.e., annually, per compliance period, per compliance cycle~~);
 2. With the exception of the first round of source water monitoring, a water system shall identify any site which was not sampled in previous monitoring periods and include an explanation of why the sampling site was changed;
 3. For systems which exceed an action level for lead or copper, the system's recommendation regarding source water treatment; and
 4. For systems required to install source water treatment, a letter certifying that the system has completed installing the treatment designated or approved by the Department within 24 months after the Department designates or approves the treatment.
 5. A large, medium, or small water system which collects source water samples for lead and copper in addition to the minimum required by R18-4-314 shall report the analytical results from any additional source water samples to the Department within ~~ten~~ 10 days following the end of the ~~six-month~~ monitoring period during which the samples are collected.
- H. Reporting requirements for lead service line replacement under R18-4-315: A public water system which is required to replace lead service lines pursuant to R18-4-315 shall report the following information to the Department:
1. Within 12 months after a system exceeds an action level for lead after installation of corrosion control or source water treatment, the system shall demonstrate in writing to the Department that it has conducted a materials evaluation to identify the initial number of lead service lines in its distribution system, and shall provide the Department with the system's schedule for replacing annually at least 7% of the initial number of lead service lines in its distribution system.
 2. Within 12 months after a system exceeds the action level for lead after installation of corrosion control treatment or source water treatment, and every 12 months thereafter, the system shall demonstrate to the Department in writing that the system has either:
 - a. Replaced in the previous 12 months at least 7% of the initial lead service lines [or a greater number of lead service lines specified by the Department under R18-4-315(F)], or
 - b. Conducted sampling which demonstrates that the lead concentration in each lead service line sample is

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less than or equal to 0.015 mg/L. In such cases, the total number of lines replaced shall equal at least ~~seven percent~~ 7% of the initial number of lead lines in place at the time the lead service line replacement program begins (or the percentage specified by the Department under R18-4-315(F)).

I. Reporting requirements under Article 4: A water supplier who is required to conduct special monitoring as prescribed in Article 4 of this Chapter, shall report the following information to the Department:

1. A water supplier who is required to conduct special monitoring for sulfate pursuant to R18-4-401 shall report the sulfate monitoring results to the Department within 30 days of receipt of analytical results.
2. A water supplier who is required to conduct special monitoring for sodium pursuant to R18-4-402 shall report the sodium monitoring results to the Department within the first ten 10 days of the month following the month in which analytical results are received. A water supplier shall notify the Arizona Department of Health Services [ADHS] and the county health department of the sodium levels by direct mail within ~~three~~ 3 months of receipt of analytical results of sodium monitoring. A copy of each notice required to be provided to ADHS and the county health department shall be sent to the Department within ten 10 days of issuance.
3. ~~A water supplier who is required to conduct special monitoring for water corrosivity characteristics pursuant to R18-4-403 shall report the water corrosivity characteristics monitoring results to the Department within the first 10 days of the month following the month in which analytical results are received.~~
- 4.3. A water supplier who is required to conduct special monitoring for unregulated volatile organic chemicals [VOC] pursuant to R18-4-404 shall report the unregulated VOC monitoring results to the Department within 30 days of receipt of analytical results.
- 5.4. A water supplier who is required to conduct special monitoring for unregulated synthetic organic chemicals [SOC] pursuant to R18-4-405 shall report the unregulated SOC monitoring results to the Department within 30 days of receipt of analytical results. A CWS or NTNCWS shall complete initial monitoring and report the unregulated SOC monitoring results to the Department by December 31, 1995.

J. Failure to comply with monitoring requirements: A water supplier shall report the failure to comply with any monitoring requirement prescribed in this Chapter to the Department within 48 hours except that a public water system which fails to comply with a total coliform monitoring requirement shall report the monitoring violation to the Department within ten 10 days of discovery.

K. Cross connection incidents: A water supplier shall submit a written cross connection incident report within ~~five~~ 5 business days to the Department and the local health authority whenever a cross connection problem has occurred which resulted in contamination of water provided by the public water system. The report shall address all of the following:

1. Date and time of discovery of the unprotected cross connection;
2. Nature of the cross connection problem;
3. Affected area;
4. Cause of the cross connection problem;
5. Public health impacts;
6. Dates and texts of any public health advisories issued;
7. Corrective actions taken; and

8. Date of completion of corrective actions.

L. Emergencies: A water supplier shall notify the Department, by telephone, as soon as possible but no later than 24 hours after the occurrence of any of the following emergencies:

1. Loss of source of the water supply;
2. Loss of supply due to major component failure;
3. Damage to power supply equipment or loss of power;
4. Contamination of water in the distribution system as a result of backflow;
5. Collapse of reservoirs or reservoir roofs or pumphouse structures;
6. Breaks in transmission or distribution lines; and
7. Chemical or microbiological contamination of the water supply.

M. Waterborne disease outbreaks: A water supplier shall report the occurrence of a waterborne disease outbreak that may be attributable to water provided by the public water system to the Department. ~~A water supplier shall report the occurrence of a waterborne disease outbreak as soon as possible but no later than 24 hours after discovery of the waterborne disease outbreak.~~

N. Confirmation sample results: A water supplier shall report the analytical results of any confirmation sample required by the Department within 24 hours of receipt of the analytical results.

O. A water supplier shall submit to the Department a representative copy of each type of public notice required by R18-4-105 that is distributed, published, posted, or made available to persons served by the public water system or to the media and an affidavit which describes how the public notice was provided within ten 10 days of the date of issuance.

P. A water supplier shall submit to the Department, within the time stated in the request, copies of any records required to be maintained under R18-4-103 or copies of any documents which the Department is entitled to inspect pursuant to Section 1445 of the Safe Drinking Water Act.

Q. The results of all analyses completed pursuant to this Chapter shall be reported to the Department in a manner and on forms approved by the Department.

R. A water supplier may contract with a laboratory or another agent to report monitoring results to the Department. In such cases, the water supplier is legally responsible for compliance with reporting requirements.

S. A water supplier shall not report an analytical result as a nondetect at a concentration which exceeds any of the following:

1. For a single point-of-entry sample:

- a. For an inorganic chemical listed in R18-4-205, except nitrate, nitrite and fluoride, a water supplier shall not report an analytical result as a nondetect at a concentration which exceeds the maximum contaminant level for the inorganic chemical.
- b. For nitrate, a water supplier shall not report an analytical result as a nondetect at a concentration which exceeds 5 mg/L.
- c. For nitrite, a water supplier shall not report an analytical result as a nondetect at a concentration which exceeds 0.5 mg/L.
- d. For fluoride, a water supplier shall not report an analytical result as a nondetect at a concentration which exceeds 2.0 mg/L.
- e. For lead, a water supplier shall not report an analytical result as a nondetect at a concentration which exceeds 0.005 mg/L.
- f. For copper, a water supplier shall not report an analytical result as a nondetect at a concentration which exceeds 0.050 mg/L.
- g. For a volatile organic chemical listed in R18-4-211,

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a water supplier shall not report an analytical result as a nondetect at a concentration which exceeds 0.0005 mg/L.

- h. For a synthetic organic chemical listed in R18-4-215 (except atrazine, dibromochloropropane, ethylene dibromide, and di(2-ethylhexyl)phthalate, a water supplier shall not report an analytical result as a nondetect at a concentration which exceeds 50% of the maximum contaminant level for the synthetic organic chemical. For atrazine, dibromochloropropane, ethylene dibromide, and di(2-ethylhexyl)phthalate, a water supplier shall not report an analytical result as a nondetect at a concentration which exceeds the maximum contaminant level.

2. For composite samples, a water supplier shall not report an analytical result as a nondetect at a concentration which exceeds any of the following:
- a. A nondetect shall not be reported in a concentration which exceeds 1/5 of the maximum contaminant level for an inorganic chemical;
 - b. Volatile organic chemicals: A nondetect shall not be reported in a concentration which exceeds 0.0005 mg/L;
 - c. Synthetic organic chemicals: Except for toxaphene and ethylene dibromide, a nondetect shall not be reported in a concentration which exceeds the detection limit for the synthetic organic chemical listed in Appendix B. For toxaphene and ethylene dibromide, a nondetect shall not be reported in a concentration which exceeds 1/5 of the maximum contaminant level;
 - d. For composite samples for lead, a nondetect shall not be reported in a concentration which exceeds 0.001 mg/L.
 - e. For composite samples for copper, a nondetect shall not be reported in a concentration which exceeds the detection limit listed for the analytical method used that is prescribed in Appendix B.

- T. A CWS shall identify and report to the Department whether the following construction materials are present in their distribution system:

- 1. Lead from piping, solder, caulking, interior lining of distribution mains, alloys, and home plumbing.
- 2. Copper from piping and alloys, service lines, and home plumbing.
- 3. Galvanized piping, service lines, and home plumbing.
- 4. Ferrous piping materials, such as cast iron and steel.
- 5. Asbestos cement pipe.
- 6. Vinyl lined asbestos cement pipe.
- 7. Coal tar-lined pipes and tanks.

R18-4-105. General Public Notification Requirements

- A. A water supplier of a public water system which fails to comply with an applicable maximum contaminant level or a treatment technique requirement shall provide public notice to persons served by the system as follows:
- 1. A water supplier shall provide public notice for a violation of a maximum contaminant level or a violation of a treatment technique by both:
 - a. Publication of notice in a daily newspaper of general circulation in the area served by the system as soon as possible but not later than 14 days after the violation. If the area served by a public water system is not served by a daily newspaper of general circulation, then the water supplier shall provide public notice ~~shall be given~~ by publication in a weekly newspaper of general circulation serving the area;

and

- b. Mail delivery of a notice of the violation by direct mail or with the water bill not later than 45 days after the ~~nonacute~~ violation. The Department may waive mail delivery of notice if the water supplier corrects the violation within the 45-day period.
2. Acute violations: In addition to the public notice requirements prescribed in subsection (A)(1), a water supplier shall provide public notice by television or radio broadcast for an acute violation. A water supplier shall provide a copy of the required public notice to radio and television stations which broadcast to the area served by the system as soon as possible but not later than 72 hours after an acute violation occurs. Acute violations are:
- a. Violation of a maximum contaminant level for total coliform when fecal coliforms or E. coli are present as specified in R18-4-202(A)(3) or R18-4-203(A)(4) R18-4-202(A)(4).
 - b. Violation of the maximum contaminant level for nitrate or nitrite as specified in R18-4-205.
 - c. Occurrence of a waterborne disease outbreak that may be attributable to water distributed by the public water system.

- ~~3.B.~~ A water supplier of a public water system which fails to conduct monitoring required by this Chapter; fails to use approved analytical methods; or which is granted an exemption or variance by the Department shall give public notice to persons served by the system by publication in a daily newspaper of general circulation within ~~three~~ 3 months of the monitoring violation or the granting of an exemption or variance. If the area served by a public water system is not served by a daily newspaper of general circulation, then a water supplier shall provide public notice by publication in a weekly newspaper of general circulation serving the area within ~~three~~ 3 months of the monitoring violation or the granting of an exemption or variance.

~~B.C.~~ Alternative public notification procedures:

- 1. Community water systems: A water supplier of a community water system that is located in an area that is not served by radio, television, or a daily or weekly newspaper of general circulation shall provide public notice by hand delivery or continuous posting in conspicuous places within the area served by the system. Posting shall continue for a minimum of 10 days and as long as any violation exists or for as long as an exemption or variance remains in effect.
 - a. Acute violations: A water supplier shall provide public notice of an acute violation by hand delivery or posting as soon as possible but not later than 72 hours after an acute violation occurs;
 - b. ~~Nonacute MCL or treatment technique~~ violations: A water supplier shall provide public notice of a ~~nonacute~~ MCL or treatment technique violation by hand delivery or posting within 14 days after a ~~nonacute~~ violation occurs.
 - c. Monitoring violations or the granting of an exemption or variance: A water supplier shall provide public notice by hand delivery or by posting within ~~three~~ 3 months of a monitoring violation or the granting of an exemption or variance.
- 2. Noncommunity water systems: In lieu of providing public notice as prescribed in subsection (A) of this Section, a water supplier of a noncommunity water system may provide public notice by hand delivery or by continuous posting in conspicuous places within the area served by the noncommunity system. Posting shall continue for a

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minimum of 10 days and as long as any violation exists or for as long as an exemption or variance remains in effect.

- a. Acute violations: A water supplier of a noncommunity water system may provide public notice by hand delivery or posting as soon as possible but not later than 72 hours after an acute violation occurs;
- b. ~~Nonacute~~ MCL or treatment technique violations: A water supplier of a noncommunity water system may provide public notice by hand delivery or posting within 14 days after a ~~nonacute~~ MCL or treatment technique violation occurs.
- c. Monitoring violations or the granting of an exemption or variance: A water supplier of a noncommunity water system may provide public notice by hand delivery or posting within ~~three~~ 3 months of the monitoring violation or the granting of an exemption or variance.

~~C.D. Repeat public notice shall be given~~ The water supplier shall give repeat public notice at least once every ~~three~~ 3 months by mail delivery, direct mail, or with the water bill for as long as any violation exists. ~~Repeat~~ The water supplier shall give repeat public notice of the existence of a variance or exemption shall be given every ~~three~~ 3 months for as long as the variance or exemption remains in effect. For community water systems and noncommunity water systems which provide public notice by posting, repeat public notice requirements are satisfied by continuous posting.

~~D.E. Public notice may be given~~ The water supplier may give public notice to only a portion of the population served by a public water system if the water supplier demonstrates that only a segment of the population served by the public water system is affected by the problem which results in the need for public notice.

~~E.F.~~ A water supplier shall give a copy of the most recent public notice for any outstanding violation of a maximum contaminant level, treatment technique requirement, or any violation of a schedule of compliance prescribed pursuant to a variance or exemption to all new billing units or hookups prior to or at the time service begins.

~~F.G.~~ The contents of each public notice shall provide a clear and readily understandable explanation of the violation; any potential adverse health effects; the population at risk; the steps that the public water system is taking to correct the violation; the necessity for using alternative water supplies, if any; and any measures the consumer should take to minimize exposure until the violation is corrected. Each public notice shall be conspicuous and free of unduly technical language, small print, editorial comments, or similar problems that frustrate the purposes of the notice. Each public notice shall include the name and telephone number of a person at the public water system who can be contacted for additional information about the notice. Where appropriate, the public notice shall be multilingual.

~~G.H.~~ A water supplier shall include the mandatory health effects language prescribed in Appendix A in a public notice for the violation of a maximum contaminant level or treatment technique and in a public notice regarding the granting or continued existence of a variance or exemption.

~~H.I.~~ Within ten days of the date of issuance of public notice, a water supplier shall submit to the Department a copy of any public notice and an affidavit which describes how public notice was provided within 10 days of the date of issuance of the public notice.

~~I.J.~~ The Department shall not provide public notice on behalf of the water supplier. If a water supplier fails to notify the public in accordance with the requirements of this Section, then the

Department may provide public notice to persons served by the public water system by any of the methods listed in this Section or by issuance of a press release. The water supplier remains legally responsible for ensuring that the requirements of this Section are met.

R18-4-109. Sample Collection, Preservation, and Transportation

- A. Sample collection shall be conducted using the sample preservation, container, and maximum holding time procedures that are prescribed by the Arizona Department of Health Services or the U.S. Environmental Protection Agency for the analytical method used.
- B. A water supplier shall identify each compliance sample as such when the sample is submitted to a testing laboratory and before the laboratory conducts any analysis of the sample.

R18-4-116. Emergency Operation Plans

- A. ~~By January 1, 1994, each~~ Each community water system shall develop and keep an emergency operations plan in an easily accessible location ~~an emergency operations plan~~. The emergency operations plan shall detail the steps that the community water system will take to assure continuation of service, as a minimum, in the following emergency situations:
 1. Loss of source of the water supply;
 2. Loss of supply due to major component failure;
 3. Damage to power supply equipment or loss of power;
 4. Contamination of water in the distribution system as a result of backflow;
 5. Collapse of reservoirs or reservoir roofs or pumphouse structures;
 6. Breaks in transmission or distribution lines; and
 7. Chemical or microbiological contamination of the water supply.
- B. The emergency operations plan required by Subsection (B) (A) of this Section shall address all of the following issues:
 1. The provision of alternate sources of water during the emergency;
 2. Notification procedures relating to regulatory agencies, news media, and users which shall include personal protection and water use guidelines;
 3. Disinfection and testing of the distribution system once service is restored;
 4. Identification of critical system components that shall remain in service or be returned to service quickly;
 5. Critical spare parts inventory; and
 6. Staff training in emergency response procedures.

R18-4-117. Unsafe Supplies

- A. The Department may order a public water system to disconnect a source to protect the public health from an acute health risk. An acute health risk is posed when one of the following occurs:
 1. There is a violation of a maximum contaminant level for total coliform when fecal coliform or *E. coli* are present that is attributable to the source;
 2. There is a violation of a maximum contaminant level for nitrate or nitrite that is attributable to the source; or
 3. There is an occurrence of a waterborne disease outbreak that is attributable to the source.
- B. ~~Whenever a well is permanently abandoned, the well shall be properly sealed and notice given to the Arizona Department of Water Resources pursuant to A.A.C. R12-15-816.~~

R18-4-119. Additives

- A. All products added directly to water during production or treatment ~~after January 1, 1993~~ shall conform to National Sanitation Foundation Standard 60, amended as of ~~October, 1988~~

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May, 1996 (and no future amendments), which is incorporated herein by reference and on file with the Office of the Secretary of State and the Department. Products covered by this requirement include water well products and those used for disinfection, oxidation, filtration, scale control, corrosion control, pH adjustment, softening, precipitation, sequestering, fluoridation, coagulation, flocculation, and miscellaneous treatments.

- B.** Materials or products used or installed after January 1, 1993, that come into contact with water or with water treatment chemicals shall conform to National Sanitation Foundation Standard 61, amended as of October, 1988 January, 1995 (and no future amendments), which is incorporated herein by reference and on file with the Office of the Secretary of State and the Department. Products and materials covered by this requirement include:
1. Process media, such as carbon and sand;
 2. Joining and sealing materials, such as solvents, cements, welding materials, and gaskets;
 3. Lubricants;
 4. Pipes and related products, such as tanks and fittings;
 5. Mechanical devices used in treatment, transmission, or distribution systems such as valves, chlorinators, and separation membranes; and
 6. Surface coatings and paints.
- C.** Evidence that a product conforms to the requirements of this Section shall be the appearance on the product or product package of the seal of a certifying entity, which has been accredited to provide such certification by the American National Standards Institute.
- D.** Where a material or product that comes into contact with drinking water is essential to the design, construction, or operation of a public water system and it does not conform to the National Sanitation Foundation standard or it conforms to the National Sanitation Foundation standard but is available from only one source, then a water supplier may use any of the following materials or products:
1. Materials or products composed entirely of ingredients which are determined to be appropriate for addition to potable water or aqueous food by the U.S. Environmental Protection Agency, the Food and Drug Administration, or other federal agency.
 2. Materials or products composed entirely of ingredients listed in the National Academy of Sciences "Water Chemicals Codex."
 3. Materials or products which are consistent with the specifications of the American Water Works Association.
 4. Materials or products which are designed for use in drinking water systems which are consistent with the specifications of the American Society for Testing and Materials.
 5. Materials or products which are in use or which have been used historically in drinking water systems, consistent with standard practice, which have not been demonstrated in past applications in the United States to have contributed to water contamination.

R18-4-121. Enforcement

- A.** ~~Any person who owns, constructs, operates or maintains a public water system. A water supplier who constructs, operates, or maintains a public water system contrary to the provisions of this Chapter or any person who fails to maintain the quality of water within such the public water system as required by this Chapter shall be subject to the actions provided in A.R.S. §§ 49-142 and 49-354.~~
- B.** If the Department determines that a public water system is not in compliance with any of the provisions of this Chapter, then the Department may issue an order to the system water supplier which requires the public water system to make no fur-

ther service connections or which limits the number of service connections until the Department determines that the public water system achieves compliance.

- C.** The Department may determine compliance or initiate enforcement action based upon analytical results and other information compiled by the Department or other federal, state, or local agencies.

ARTICLE 2. MAXIMUM CONTAMINANT LEVELS AND MONITORING REQUIREMENTS

R18-4-201. Maximum Contaminant Levels; Public Water Systems Affected

- A.** Except as provided in this Section, the maximum contaminant levels prescribed in this Article apply to water distributed by a public water system.
- B.** Only the maximum contaminant levels for nitrate, nitrite, and total coliform apply to water distributed by a transient, non-community water system. The interim maximum contaminant levels for turbidity apply to a transient, noncommunity water system that is a surface water system which does not provide filtration.
- C.** The maximum contaminant level for fluoride ~~applies arsenic, and radiochemicals apply~~ only to water distributed by a community water system.
- D.** The interim maximum contaminant levels for turbidity apply only to water that is distributed by a surface water system which does not provide filtration.
- E.** The maximum contaminant level for total trihalomethanes applies only to water distributed by a community water system which serves a population of 10,000 or more and which adds a halogenated disinfectant to the water in any part of the treatment process.

R18-4-205. Inorganic Chemicals; MCLs

- A.** Water that is distributed by a community water system or a nontransient, noncommunity water system shall not exceed the following maximum contaminant levels for inorganic chemicals:

Contaminant	MCL (mg/L)	Alternate MCL (mg/L)
Antimony	0.006	
Arsenic ^a	0.05	
Asbestos	7 MFL ^b	
Barium	2	
Beryllium	0.004	
Cadmium	0.005	
Chromium	0.1	
Cyanide (as free cyanide)	0.2	
Fluoride ^a	4.0	
Mercury	0.002	
Nickel	0.1	
Nitrate (as N)	10	20c
Nitrite (as N)	1	
Total nitrate/nitrite	10	20c
Selenium	0.05	
Thallium	0.002	

^a "MFL" means million fibers per liter greater than ten microns.

^b The maximum contaminant level for fluoride applies to community water systems only.

^a The maximum contaminant levels for fluoride and arsenic apply to community water systems only.

^b "MFL" means million fibers per liter greater than ten microns in length.

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The Department may allow a public water system to comply with the alternate maximum contaminant level for nitrate and for total nitrate/nitrite provided all of the following conditions are met: 1) the public water system is a noncommunity water system; 2) water provided by the noncommunity water system will not be available to children under ~~six~~ 6 months of age; 3) the water supplier continuously posts notice of the fact that nitrate levels may exceed the MCL of 10 mg/L; 4) the water supplier continuously posts notice of the potential health effects exposure to infants under ~~six~~ 6 months of age; 5) the water supplier notifies the Department annually of nitrate levels that exceed 10 mg/L; and 6) no adverse health effects result.

- B. Water that is distributed by a transient, noncommunity water system [NTNCWS] shall not exceed the maximum contaminant levels for nitrate, nitrite, and total nitrate/nitrite. The maximum contaminant levels for other inorganic chemicals listed in R18-4-205 do not apply to water that is distributed by a transient, noncommunity water system.

R18-4-206. Monitoring Requirements for Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cyanide, Fluoride, Mercury, Nickel, Selenium, and Thallium.

- A. A transient, noncommunity water system is not required to monitor for the inorganic chemicals listed in this Section. Community water systems [CWS] and nontransient, noncommunity water systems [NTNCWS] shall conduct monitoring for the following inorganic chemicals:
1. Each CWS shall conduct monitoring to determine compliance with the maximum contaminant levels for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, ~~nickel~~, selenium, and thallium.
 2. Each NTNCWS shall conduct monitoring to determine compliance with the maximum contaminant levels for all of the inorganic chemicals listed in subsection (A)(1) except fluoride and arsenic.
- B. Each CWS or NTNCWS shall conduct initial monitoring for inorganic chemicals listed in this Section in the monitoring year designated by the Department according to the following schedule:
1. Each CWS shall conduct initial monitoring for arsenic, barium, cadmium, chromium, fluoride, mercury, and selenium in the compliance period that begins on January 1, 1993.
 2. Each NTNCWS shall conduct initial monitoring for ~~arsenic~~, barium, cadmium, chromium, mercury, and selenium in the compliance period that begins on January 1, 1993.
 3. Each CWS and NTNCWS serving 150 or more service connections shall conduct initial monitoring for antimony, beryllium, cyanide, ~~nickel~~, and thallium in the compliance period that begins January 1, 1993.
 4. Each CWS AND NTNCWS with less than 150 service connections shall conduct initial monitoring for antimony, beryllium, cyanide, ~~nickel~~, and thallium in the compliance period that begins January 1, 1996.
- C. Each CWS and NTNCWS shall conduct monitoring for inorganic chemicals at each sampling point as prescribed in R18-4-218.
- D. A CWS or NTNCWS may composite samples for inorganic chemicals as prescribed in R18-4-219.
- E. Each CWS and NTNCWS shall conduct monitoring at the following frequencies:
1. Each CWS or NTNCWS shall take ~~one~~ 1 sample at each groundwater sampling point ~~during each compliance period [i.e., once every three years]~~ once every 3 years.
 2. Each CWS or NTNCWS shall take ~~one~~ 1 sample annually at each surface water sampling point ~~during each compliance period~~.
- F. A water supplier may use monitoring data collected prior to January 1, 1993 to satisfy initial monitoring requirements at a sampling point provided at least one sample was taken after January 1, 1990.
- G. If the analytical results from a sampling point indicate that the concentration of an inorganic chemical exceeds a maximum contaminant level, then a CWS or NTNCWS shall take quarterly samples at that sampling point, beginning in the calendar quarter immediately following collection of the sample which exceeded the maximum contaminant level. A CWS or NTNCWS shall continue quarterly sampling at the sampling point until:
1. Groundwater sampling points: A minimum of ~~two~~ 2 consecutive quarterly samples are taken and the concentration of the inorganic chemical in each sample is below the maximum contaminant level. If this criterion is met, the Department may decrease the monitoring frequency from quarterly to ~~one~~ 1 sample every ~~three~~ 3 years. The decision to reduce monitoring frequency shall be in writing.
 2. Surface water sampling points: A minimum of ~~four~~ 4 consecutive quarterly samples are taken and the concentration of the inorganic chemical in each sample is below the maximum contaminant level. If this criterion is met, the Department may decrease monitoring frequency from quarterly to annually. The decision to reduce monitoring frequency shall be in writing.
- H. Where the analytical results of an initial sample indicate that there is an exceedance of a maximum contaminant level, the Department may require that ~~one~~ 1 confirmation sample be taken as soon as possible after the initial sample was taken, but not to exceed ~~two~~ 2 weeks, at the same sampling point.
- I. Compliance with a maximum contaminant level for an inorganic chemical shall be determined based upon the analytical result from a single sample obtained at each sampling point unless a confirmation sample is required by the Department. If the Department requires that a confirmation sample be taken, then the results of the initial sample and the confirmation sample shall be averaged. The resulting average shall be used to determine compliance with the maximum contaminant level.
- J. A water supplier may apply to the Department to conduct monitoring at a sampling point more frequently than the monitoring frequency specified in subsection (E). ~~A water supplier shall not conduct monitoring at a sampling point at a frequency greater than quarterly.~~ If the Department gives written approval to conduct ~~quarterly~~ more frequent monitoring at a sampling point, then compliance shall be determined by a running annual average at that sampling point. ~~A water supplier shall not conduct monitoring at a sampling point at a frequency greater than quarterly.~~ If the running annual average at the sampling point is greater than the maximum contaminant level, then the public water system is out of compliance. If any ~~one~~ 1 sample would cause the running annual average to exceed the maximum contaminant level, then the public water system is out of compliance immediately.
- K. A water supplier may make a written request to reduce monitoring frequency at a sampling point. The Department may reduce monitoring frequency at a sampling point as follows:
1. Groundwater sampling points: The Department may reduce monitoring frequency at a groundwater sampling

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point from once every ~~three~~ 3 years to a less frequent basis if a public water system has monitored at least once every ~~three~~ 3 years for ~~nine~~ 9 years at the groundwater sampling point and all previous analytical results for the inorganic chemical are below the maximum contaminant level. At least ~~one~~ 1 sample shall have been taken after January 1, 1990.

2. Surface water sampling points: The Department may reduce monitoring frequency at a surface water sampling point from annually to a less frequent basis if the surface water system has monitored annually at the surface water sampling point for at least ~~three~~ 3 consecutive years and all previous analytical results for the inorganic chemical are below the maximum contaminant level. At least ~~one~~ 1 sample shall have been taken after January 1, 1990.
3. The Department may reduce monitoring frequency at a sampling point for a term not to exceed ~~nine~~ 9 years.
4. A CWS or NTNCWS shall take at least ~~one~~ 1 sample at each sampling point during the term of reduced monitoring.
5. In determining the appropriate reduced monitoring frequency at a sampling point during the term of reduced monitoring, the Department shall consider the following factors:
 - a. Reported concentrations of the inorganic chemical from all previous monitoring;
 - b. The degree of variation in the reported concentrations of the inorganic chemical; and
 - c. Other factors that may affect the concentration of the inorganic chemical such as changes in groundwater pumping rates, changes in the configuration of the CWS or NTNCWS or changes in operating procedures, stream flows, or source water characteristics.
6. A decision by the Department to reduce monitoring frequency at a sampling point shall be in writing and shall set forth the grounds for the decision. A water supplier may make a written request for reduced monitoring or reduced monitoring may be granted on the Department's initiative. A water supplier shall provide documentation of analytical results which supports the request for reduced monitoring. When a CWS or NTNCWS submits new data or when other data relevant to the public water system's appropriate monitoring frequency becomes available, the Department shall review that data and, where appropriate, revise its determination of appropriate monitoring frequency.
7. A CWS or NTNCWS which uses a new source is not eligible for reduced monitoring until ~~three~~ 3 consecutive rounds of monitoring from the new source have been completed.

- L. The Department may grant a public water system a waiver for the monitoring of cyanide if the Department determines that the system is not vulnerable due to absence of any industrial source of cyanide.

R18-4-208. Nitrate; monitoring requirements

- A. All public water systems, including transient, noncommunity water systems, shall conduct monitoring to determine compliance with the maximum contaminant level for nitrate.
- B. Monitoring to determine compliance with the maximum contaminant level for nitrate shall be conducted at each sampling point as prescribed in R18-4-218.
- C. A public water system may composite nitrate samples as prescribed in R18-4-219.
- D. Each public water system shall conduct monitoring for nitrate at the following frequencies:

1. A community water system [CWS] or a nontransient, noncommunity water system [NTNCWS] shall monitor annually at each groundwater sampling point ~~during each compliance period.~~
 2. A CWS or NTNCWS shall monitor quarterly at each surface water sampling point ~~during each compliance period.~~
 3. All transient, noncommunity water systems shall monitor annually at each sampling point ~~during each compliance period.~~
- E. The Department may reduce the monitoring frequency at a surface water sampling point from quarterly to annually if the analytical results from the sampling point demonstrate that the concentration of nitrate is less than 5 mg/L for ~~four~~ 4 consecutive quarters. A CWS or NTNCWS shall return to quarterly monitoring at a surface water sampling point if the analytical result for any sample indicates that the concentration of nitrate is greater than or equal to 5 mg/L. If the Department reduces the monitoring frequency at a surface water sampling point from quarterly to annually, then the annual sample shall be taken during the quarter which previously yielded the highest analytical result for nitrate. The Department's decision to allow a CWS or NTNCWS to reduce monitoring frequency at a surface water sampling point shall be in writing.
- F. A CWS or NTNCWS which collects a sample from a groundwater sampling point with a concentration of nitrate that is greater than or equal to 5 mg/L shall increase the monitoring frequency at that sampling point from annually to quarterly. The Department may subsequently reduce the monitoring frequency at that groundwater sampling point from quarterly to annually if the analytical results for ~~four~~ 4 consecutive quarterly samples are less than 10 mg/L. If the Department reduces the monitoring frequency at the groundwater sampling point from quarterly to annually, then the annual sample shall be taken during the quarter which previously yielded the highest analytical result for nitrate. If the Department reduces the monitoring frequency at the groundwater sampling point from quarterly to annually, a subsequent detection of nitrate in a concentration that is greater than or equal to 5 mg/L and less than or equal to 10 mg/L shall not trigger quarterly monitoring. The Department's decision to allow a CWS or NTNCWS to reduce monitoring frequency at a groundwater sampling point to annually shall be in writing.
- G. The Department shall not accept monitoring data collected before January 1, 1993, to satisfy initial monitoring requirements for nitrate.
- H. Monitoring waivers for nitrate are not allowed.
- I. If the analytical result obtained from a sample indicates that the concentration of nitrate exceeds 10 mg/L, then a water supplier shall take a confirmation sample at the same sampling point within 24 hours of receipt of the results of the initial sample. A water supplier who is unable to take a confirmation sample within 24 hours shall issue public notice to persons served by the system in accordance with R18-4-105. A water supplier who does not take a confirmation sample within 24 hours and who issues public notice shall take and complete the analysis of a confirmation sample within ~~two~~ 2 weeks of receiving the analytical results of the initial sample.
- J. Compliance with the maximum contaminant level for nitrate shall be determined based upon the average of the analytical results of the initial sample and the confirmation sample. If a water supplier fails to take the required confirmation sample within the time frames prescribed in subsection (I), then compliance shall be determined based upon the initial sample.

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R18-4-209. Nitrite; monitoring requirements

- A. All public water systems, including transient, noncommunity water systems, shall conduct monitoring to determine compliance with the maximum contaminant level for nitrite.
- B. Each public water system shall conduct monitoring to determine compliance with the maximum contaminant level for nitrite at each sampling point as prescribed in R18-4-218.
- C. A public water system may composite nitrite samples as prescribed in R18-4-219.
- D. A public water system shall take ~~one~~ 1 sample at each sampling point during the initial compliance period. Each public water system shall conduct monitoring for nitrite in the monitoring year specified by the Department within the initial compliance period ~~in the compliance cycle beginning January 1, 1993.~~
- E. If the analytical result of the initial sample at a sampling point is less than 0.5 mg/L (as N), then a public water system is not required to take another sample at that sampling point until the initial first compliance period of the next compliance cycle.
- F. If the analytical result of the initial sample at a sampling point is greater than or equal to 0.5 mg/L (as N), then a public water system shall conduct quarterly monitoring at that sampling point for at least four consecutive quarters.
- G. The Department may reduce the monitoring frequency at a sampling point from quarterly to annually if the results of ~~four~~ 4 consecutive quarterly samples demonstrate that the concentration of nitrite in each sample is less than 1 mg/L (as N). If the Department reduces the monitoring frequency from quarterly to annually, then the public water system shall take subsequent annual samples during the quarter which previously yielded the highest analytical result for nitrite. If the Department reduces the monitoring frequency at a sampling point from quarterly to annually and there is a subsequent detection of nitrite at that sampling point in a concentration that is greater than or equal to 0.5 mg/L and less than or equal to 1 mg/L, the detection shall not trigger quarterly monitoring. The Department's decision to reduce monitoring frequency shall be in writing.
- H. The Department shall not accept monitoring data collected before January 1, 1993, to satisfy initial monitoring requirements for nitrite.
- I. Monitoring waivers for nitrite are not allowed.
- J. A public water system shall take a confirmation sample if the analytical result of ~~any~~ the initial sample indicate that the concentration of nitrite exceeds 1 mg/L (as N). The confirmation sample shall be taken at the same sampling point within 24 hours of receipt of analytical results of the initial sample. A water supplier who cannot take a confirmation sample within 24 hours shall issue public notice to persons served by the system in accordance with R18-4-105 and shall take and complete the analysis of a confirmation sample within ~~two~~ 2 weeks of receiving the analytical results of the initial sample.
- K. Compliance with the maximum contaminant level for nitrite shall be determined based upon the average of the analytical results of the initial sample and the confirmation sample. If a water supplier fails to take the required confirmation sample, then compliance shall be determined based upon the analytical results from the initial sample.

R18-4-212. Volatile Organic Chemicals; Monitoring Requirements

- A. Community water systems [CWS] and nontransient, noncommunity water systems [NTNCWS] shall conduct monitoring to determine compliance with the maximum contaminant levels for the volatile organic chemicals listed in R18-4-211. Transient, noncommunity water systems are not required to monitor for volatile organic chemicals listed in R18-4-211.

- B. A CWS or NTNCWS shall conduct monitoring for volatile organic chemicals during the compliance period that begins on January 1, 1993, in the monitoring year designated by the Department, except that:

- 1. A CWS and NTNCWS shall conduct monitoring for vinyl chloride only as prescribed in R18-4-213; and
- 2. Each CWS and NTNCWS with less than 150 service connections shall conduct monitoring for dichloromethane, 1,2,4-trichlorobenzene, and 1,1,2-trichloroethane in the compliance period which begins January 1, 1996.

- C. Each CWS and NTNCWS shall conduct monitoring to determine compliance with the maximum contaminant levels for volatile organic chemicals at each sampling point as prescribed in R18-4-218.
- D. A water supplier may composite samples for volatile organic chemicals as prescribed in R18-4-219.
- E. A CWS or NTNCWS shall take ~~four~~ 4 consecutive quarterly samples at each sampling point for each volatile organic chemical listed in R18-4-211 (except vinyl chloride) during the initial compliance period ~~beginning January 1, 1993,~~ unless a CWS or NTNCWS qualifies for reduced monitoring or obtains a monitoring waiver. A CWS or NTNCWS shall conduct initial monitoring for volatile organic chemicals in the monitoring year designated by the Department within the initial compliance period.
- F. The Department may accept monitoring data which was collected after January 1, 1988 and prior to January 1, 1993 to satisfy initial monitoring requirements for a volatile organic chemical listed in R18-4-211 (i.e., a single sample rather than four consecutive quarterly samples). A CWS or NTNCWS which uses grandfathered monitoring data and which did not detect any volatile organic chemical listed in R18-4-211 at a sampling point shall take ~~one~~ 1 sample annually at that sampling point in the initial compliance period ~~which begins January 1, 1993.~~
- G. If a volatile organic chemical is not detected at a groundwater or surface water sampling point in ~~four~~ 4 consecutive quarterly samples during the initial compliance period, then a CWS or NTNCWS shall take ~~one~~ 1 sample annually at that groundwater or surface water sampling point in repeat compliance periods. After a minimum of ~~three~~ 3 years of sampling (including the ~~four~~ 4 consecutive quarterly samples taken during the initial compliance period) with no detections of a volatile organic chemical at a groundwater sampling point, the Department may reduce monitoring frequency for that volatile organic chemical at that groundwater sampling point to ~~one~~ 1 sample every ~~three~~ 3 years ~~[i.e., once during each compliance period].~~ The Department shall not reduce monitoring frequency at a surface water sampling point to less than annually. The Department's decision to allow reduced monitoring at a sampling point shall be in writing.
- H. If a volatile organic chemical is detected at a sampling point in a concentration which is greater than or equal to 0.0005 mg/L, then a CWS or NTNCWS shall sample quarterly for the volatile organic chemical at that sampling point, beginning in the quarter immediately following collection of the sample in which the volatile organic chemical was detected. A CWS or NTNCWS shall continue quarterly monitoring at the sampling point until:
 - 1. For a groundwater sampling point, a minimum of ~~two~~ 2 consecutive quarterly samples are taken (which may include the initial detection) and the concentration of the volatile organic chemical in each sample is below the maximum contaminant level. If the concentration of the volatile organic chemical is below the maximum contaminant level for a minimum of ~~two~~ 2 consecutive quarterly

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samples, then the Department may reduce monitoring frequency at the groundwater sampling point from quarterly to annually. If the Department reduces monitoring frequency to annually, then a CWS or NTNCWS shall take the annual sample during the quarter which previously yielded the highest analytical result. If the concentration of the volatile organic chemical is below the maximum contaminant level 0.0005 mg/L for three 3 consecutive annual samples, then a CWS or NTNCWS may request that the Department further reduce monitoring frequency to once every three 3 years or apply for a monitoring waiver.

2. For a surface water sampling point, a minimum of four 4 consecutive quarterly samples are taken (which may include the initial detection) and the concentration of the volatile organic chemical in each sample is below the maximum contaminant level. If the concentration of the volatile organic chemical is below the maximum contaminant level for a minimum of four 4 consecutive quarterly samples, then the Department may reduce monitoring frequency at the surface water sampling point from quarterly to annually. If the Department reduces monitoring frequency to annually, then a CWS or NTNCWS shall take the annual sample during the quarter which previously yielded the highest analytical result. The Department shall not reduce monitoring frequency at a surface water sampling point to less than annually.
- I. The Department may increase required require increased monitoring for a volatile organic chemical where necessary to detect variations in a CWS or NTNCWS. A Department decision to require increased monitoring shall be in writing.
- J. Compliance with the maximum contaminant level for a volatile organic chemical shall be determined based upon the analytical results obtained at each sampling point.
 1. For a CWS or NTNCWS which samples quarterly or more frequently, compliance shall be determined by the running annual average of samples taken at each sampling point. If the running annual average at any sampling point is greater than the maximum contaminant level, then the system is out of compliance. If any quarterly sample would cause the running annual average to be exceeded, then the system is out of compliance immediately.
 2. If a CWS or NTNCWS samples on an annual or less frequent basis, the system is out of compliance if the concentration of a volatile organic chemical in a single sample exceeds the maximum contaminant level.
 3. A CWS or NTNCWS that is determined to be out of compliance with a maximum contaminant level for a volatile organic chemical at a groundwater or surface water sampling point shall take a minimum of four 4 consecutive quarterly samples at that sampling point. The CWS or NTNCWS shall continue quarterly monitoring until the running annual average is below the maximum contaminant level. If the running annual average is below the maximum contaminant level, then the Department may reduce monitoring frequency at the groundwater or surface water sampling point from quarterly to annually. If the Department reduces monitoring frequency to annually, then a CWS or NTNCWS shall take the annual sample during the quarter which previously yielded the highest analytical result. If the concentration of the volatile organic chemical at a groundwater sampling point is below the maximum contaminant level for three 3 consecutive annual samples, then a CWS or NTNCWS may request that the Department further reduce monitoring frequency at that groundwater sampling point to once every three 3 years. The Department shall not reduce monitoring frequency at a surface water sampling point to less than annually.
4. If a confirmation sample is required by the Department, the analytical result must be averaged with the initial analytical result and the average used in the compliance determination as specified in subsection (J)(1) or (2). The Department may delete results of obvious sampling errors from this calculation.
- K. The Department may require a confirmation sample for positive or negative results.
- L. A CWS or NTNCWS which does not detect a volatile organic chemical at a sampling point in a concentration greater than or equal to 0.0005 mg/l during after completing initial monitoring may submit a written request to the Department for a waiver from repeat monitoring requirements. A CWS or NTNCWS may not obtain a waiver from initial monitoring requirements. The Department may grant a monitoring waiver provided the CWS or NTNCWS is determined to be nonvulnerable, based upon a vulnerability assessment. A monitoring waiver for a groundwater sampling point shall be effective for a term not to exceed six 6 years. A monitoring waiver for a surface water sampling point shall be effective for a three-year 3-year term. The Department's decision to grant or deny a request for a monitoring waiver shall be in writing. The Department may grant a use or susceptibility waiver after evaluating the following factors:
 1. Knowledge of previous use (including transport, storage, or disposal) of the volatile organic chemical within the watershed or zone of influence of the system. If the Department determines that there has been no previous use of the volatile organic chemical within the watershed or zone of influence, a use waiver may be granted.
 2. If previous use of the volatile organic chemical is unknown or if it has been used previously, then the following factors shall be used to determine whether a susceptibility waiver is granted:
 - a. Previous analytical results;
 - b. The proximity of the CWS or NTNCWS to a potential point or nonpoint source of contamination. Point sources include spills or leaks of chemicals at or near a water treatment plant or distribution system pipelines; or at manufacturing, distribution or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities;
 - c. The environmental persistence and transport of the volatile organic chemical;
 - d. The number of persons served by the CWS or NTNCWS and the proximity of a smaller system to a larger system; and
 - e. How well the water source is protected against contamination. Groundwater systems shall consider factors such as the depth of the well, the type of soil, and wellhead protection. Surface water systems shall consider watershed protection.
 3. As a condition of a monitoring waiver for a groundwater sampling point, a CWS or NTNCWS shall take one 1 sample at the groundwater sampling point during the time the waiver is effective (i.e., one 1 sample every six 6 years). A CWS or NTNCWS also shall update its vulnerability assessment during the term of the waiver, considering the factors listed in subsection (L)(2) above. The Department may renew a waiver based upon an updated vulnerability assessment, provided the assessment recon-

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firms that the CWS or NTNCWS is nonvulnerable. If the Department does not reconfirm nonvulnerability within three 3 years of the initial determination, then the waiver is invalidated and the CWS or NTNCWS is required to sample annually in the next compliance period.

4. A CWS or NTNCWS which receives a monitoring waiver for a surface water sampling point shall sample at the frequency specified by the Department (if any). A CWS or NTNCWS shall update its vulnerability assessment during each compliance period. The Department may renew a waiver based upon an updated vulnerability assessment, provided the assessment reconfirms that the CWS or NTNCWS is nonvulnerable. If the Department does not reconfirm nonvulnerability, then the waiver is invalidated and a CWS or NTNCWS is required to sample annually at the surface water sampling point in the next compliance period.

R18-4-213. Vinyl Chloride; Monitoring Requirements

- A. A community water system [CWS] or a nontransient, noncommunity water system [NTNCWS] which detects trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene at a groundwater sampling point shall monitor quarterly for vinyl chloride at that sampling point. If vinyl chloride is not detected in the first quarterly sample, then the Department may reduce the quarterly monitoring frequency for vinyl chloride to one sample during each compliance period. The Department's decision to reduce monitoring frequency for vinyl chloride shall be in writing.
- B. A CWS or NTNCWS which detects one of the volatile organic chemicals listed in subsection (A) at a surface water sampling point shall monitor for vinyl chloride at a frequency specified by the Department.
- C. A water supplier shall not composite samples for vinyl chloride.

R18-4-215. Synthetic Organic Chemicals: MCLs

Water distributed by a community water system or nontransient, noncommunity water system shall not exceed the following maximum contaminant levels for synthetic organic chemicals:

Contaminant	MCL (mg/L)
Alachlor	0.002
Atrazine	0.003
Benzo(a)pyrene	0.0002
Carbofuran	0.04
Chlordane	0.002
2,4-D	0.07
Dalapon	0.2
Dibromochloropropane (DBCP)	0.0002
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.006
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene dibromide (EDB)	0.00005
Glyphosate	0.7
Heptachlor	0.0004
Heptachlor epoxide	0.0002
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.04
Oxamyl	0.2
Pentachlorophenol	0.001

Picloram	0.5
Polychlorinated biphenyls (PCBs) (as decachlorobiphenyl)	0.0005
Simazine	0.004
2,3,7,8-TCDD (Dioxin)	3×10^{-8}
Toxaphene	0.003
2,4,5-TP (Silvex)	0.05

R18-4-216. Synthetic Organic Chemicals; Monitoring Requirements

- A. Each community water system [CWS] and nontransient, noncommunity water system [NTNCWS] shall conduct monitoring to determine compliance with the maximum contaminant levels for synthetic organic chemicals listed in R18-4-215. Transient, noncommunity water systems are not required to monitor for synthetic organic chemicals.
- B. A CWS or NTNCWS shall conduct initial monitoring for synthetic organic chemicals in the monitoring year designated by the Department according to the following schedule:
 1. A CWS or NTNCWS with 150 or more service connections shall conduct initial monitoring to determine compliance with the maximum contaminant levels for all of the synthetic organic chemicals listed in R18-4-215 in the compliance period which begins January 1, 1993.
 2. A CWS or NTNCWS with less than 150 service connections shall conduct initial monitoring to determine compliance with the maximum contaminant levels for alachlor, atrazine, carbofuran, chlordane, 2,4-D, ~~dibromochloropropane~~ dibromochloropropane (DBCP), ethylene dibromide (EDB), heptachlor, heptachlor epoxide, lindane, methoxychlor, PCBs, pentachlorophenol, toxaphene, and 2,4,5-TP (Silvex) in the compliance period which begins January 1, 1993.
 3. A CWS or NTNCWS with less than 150 service connections shall conduct initial monitoring to determine compliance with the maximum contaminant levels for benzo(a)pyrene, dalapon, di(2-ethylhexyl)adipate, di(2-ethylhexyl)phthalate, dinoseb, diquat, endothall, endrin, glyphosate, hexachlorobenzene, hexachlorocyclopentadiene, oxamyl, picloram, simazine, and 2,3,7,8-TCDD (dioxin) in the compliance period that begins January 1, 1996.
- C. Each CWS and NTNCWS shall conduct monitoring to determine compliance with the maximum contaminant levels for synthetic organic chemicals at each sampling point as prescribed in R18-4-218.
- D. A water supplier may composite samples for synthetic organic chemicals as prescribed in R18-4-219.
- E. Each CWS and NTNCWS shall take ~~four~~ 4 consecutive quarterly samples at each sampling point during each compliance period. If no synthetic organic chemicals are detected at a sampling point during the initial compliance period, then the Department may reduce monitoring frequency in repeat compliance periods pursuant to subsection (G) below. The Department's decision to reduce monitoring frequency shall be in writing.
- F. A CWS or NTNCWS may use monitoring data collected after January 1, 1990, and prior to January 1, 1993, to satisfy initial monitoring requirements for the initial compliance period provided the data are generally consistent with the requirements of this Section.
- G. If a CWS or NTNCWS does not detect a synthetic organic chemical at a sampling point in the initial compliance period, the Department may reduce monitoring frequency at that sampling point in repeat compliance periods as follows:
 1. For a CWS or NTNCWS which serves more than 3,300 persons, the Department may reduce monitoring fre-

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- quency to a minimum of ~~two~~ 2 quarterly samples in ~~one~~ 1 year at each sampling point during each repeat compliance period. Quarterly samples shall not be taken in consecutive quarters.
2. For a CWS or NTNCWS which serves 3,300 or fewer persons, the Department may reduce monitoring frequency to a minimum of ~~one~~ 1 sample at each sampling point during each repeat compliance period.
- H. If a CWS or NTNCWS detects a synthetic organic chemical listed in R18-4-215 (except atrazine, dibromochloropropane, ethylene dibromide and di(2-ethylhexyl)phthalate at a sampling point in a concentration that is greater than or equal to 50% of the maximum contaminant level for that synthetic organic chemical, then the system shall conduct quarterly monitoring for that synthetic organic chemical at that sampling point, beginning in quarter immediately following collection of the sample where the synthetic organic chemical was detected. If a CWS or NTNCWS detects atrazine, dibromochloropropane, ethylene dibromide, ~~and or~~ di(2-ethylhexyl)phthalate at a sampling point in a concentration that is greater than the maximum contaminant level then the CWS or NTNCWS shall conduct quarterly monitoring for that contaminant. The CWS or NTNCWS shall continue quarterly monitoring at the sampling point until:
1. For groundwater sampling points, a minimum of ~~two~~ 2 consecutive quarterly samples are taken and the concentration of the synthetic organic chemical in each sample is below the maximum contaminant level. If the initial detection which triggers quarterly monitoring is at a concentration which exceeds the maximum contaminant level for a synthetic organic chemical, then a groundwater system shall take a minimum of ~~four~~ 4 consecutive quarterly samples at the sampling point and the concentration of the synthetic organic chemical in each sample is below the maximum contaminant level.
 2. For surface water sampling points, a minimum of ~~four~~ 4 consecutive quarterly samples are taken and the concentration of the synthetic organic chemical in each sample is below the maximum contaminant level.
 3. If the concentration of a synthetic organic chemical is below the maximum contaminant level for the minimum number of consecutive quarterly samples prescribed in subsections (H)(1) or (H)(2) above, then the Department may reduce monitoring frequency at the sampling point from quarterly to annually. The Department's decision to reduce monitoring frequency from quarterly to annually shall be in writing. If the Department reduces monitoring frequency to annually, a CWS or NTNCWS shall take the annual sample during the quarter which previously yielded the highest analytical result. A CWS or NTNCWS which has ~~three~~ 3 consecutive annual samples with no detections of a synthetic organic chemical may submit a written request to the Department for a monitoring waiver according to subsection (M) below.
- I. The Department may increase monitoring frequency, where necessary, to detect variations within a CWS or NTNCWS [e.g., fluctuations in concentration due to seasonal use, changes in water source]. The Department's decision to increase monitoring frequency shall be in writing.
- J. If monitoring results in the detection of either heptachlor or heptachlor epoxide, then subsequent monitoring shall analyze for both synthetic organic chemicals.
- K. Compliance with the maximum contaminant level for a synthetic organic chemical shall be determined based upon the analytical results from each sampling point.
1. For a CWS or NTNCWS which samples quarterly or more frequently, compliance is determined by the running annual average of all samples taken at each sampling point. If the running annual average is greater than the maximum contaminant level, then the system is out of compliance. If any sample would cause the running annual average to be exceeded, then the system is out of compliance immediately. Any sample below the detection limit shall be calculated as zero for purposes of determining the running annual average.
 2. If a CWS or NTNCWS samples on an annual or less frequent basis at a sampling point, then the system is out of compliance if the concentration of a synthetic organic chemical in a single sample exceeds the maximum contaminant level.
- L. The Department may require a confirmation sample. If the Department requires a confirmation sample, then the analytical results from the confirmation sample shall be averaged with the analytical results from the initial sample. The average shall be used for determining compliance under subsection (K)(2).
- M. A CWS or NTNCWS may submit a written request to the Department for a waiver from the monitoring requirements for a synthetic organic chemical. A monitoring waiver is effective for one compliance period (i.e., three years). The Department's decision to grant a monitoring waiver shall be in writing. A CWS or NTNCWS shall reapply for a monitoring waiver in each subsequent compliance period. A CWS or NTNCWS which receives a monitoring waiver is not required to monitor for a synthetic organic chemical during the term of the waiver. The Department may grant a monitoring waiver as follows:
1. Use waivers: The Department may grant a use waiver based upon knowledge of previous use (including transport, storage, or disposal of the synthetic organic chemical within the watershed or zone of influence of the CWS or NTNCWS. If the Department determines that there has been no previous use of a synthetic organic chemical, a waiver may be granted. If previous use of the synthetic organic chemical is unknown or if the synthetic organic chemical has been used previously, then a waiver may be granted based upon a vulnerability assessment.
 2. Monitoring waiver based upon vulnerability assessment: The Department may grant a monitoring waiver because a CWS or NTNCWS is determined to be nonvulnerable, based upon the results of a vulnerability assessment. The Department shall consider the following factors in making the waiver determination:
 - a. Previous analytical results;
 - b. The proximity of the CWS or NTNCWS to a potential point source or nonpoint source of contamination. Point sources include spills and leaks of synthetic organic chemicals at or near a water treatment plant or distribution system, or at a manufacturing, distribution or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Nonpoint sources include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, homes, and gardens, and other land application uses;
 - c. The environmental persistence and transport of the synthetic organic chemical;
 - d. How well the water source is protected against contamination by synthetic organic chemicals due to such factors as geology and well design (e.g., depth to groundwater, type of soil and the integrity of the

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- well casing);
 - e. Elevated nitrate levels at the water supply source;
 - f. Use of PCBs in equipment used in the production, storage, or distribution of water; and
 - g. Wellhead protection assessments.
- N. Each CWS or NTNCWS which monitors for PCBs shall analyze each sample using either EPA Method 505 or EPA Method 508. If PCBs are not detected (as one of seven Aroclors) in any sample, then the public water system shall be deemed to be in compliance with the maximum contaminant level for PCBs. If PCBs are detected (as one of seven Aroclors) in any sample, then the sample shall be reanalyzed using EPA Method 508(A) to quantitate PCBs as decachlorobiphenyl. Compliance with the maximum contaminant level for PCBs shall be based upon the analytical results of analyses using EPA Method 508(A).

R18-4-217. Radiochemicals: MCLs and Monitoring Requirements

- A. Water distributed by a community water system [CWS] shall not exceed the following maximum contaminant levels:
1. 5 pCi/L for combined Radium-226 and Radium-228;
 2. 15 pCi/L for gross alpha particle activity, including Radium-226 but excluding Radon and Uranium;
 3. The average annual concentration of man-made beta particle and photon emitters shall not produce an annual dose equivalent to the total body or any internal organ greater than four millirem/year; and
 4. Except for the radionuclides listed in this paragraph, the concentration of man-made beta particle and photon emitters causing four millirem total body or organ dose equivalents shall be calculated on the basis of a two liter per day drinking water intake using the 168-hour data listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," NBS Handbook 69, U.S. Department of Commerce, (as amended August, 1963 and no future editions), which is incorporated by reference and on file with the Office of the Secretary of State and the Department.
 - a. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any internal organ shall not exceed four millirem/year.
 - b. The following average annual concentrations shall be assumed to produce a total body or organ dose of four millirem per year:

Radionuclide	Critical organ	pCi/L
Tritium	Total body	20,000
Strontium-90	Bone marrow	8
- B. A CWS shall monitor for gross alpha particle activity, Radium-226, and Radium-228 as follows:
1. A CWS shall monitor each source for radiochemical contaminants at four year intervals. Initial sampling of a new water source for a CWS shall begin within 90 days of the introduction of the source and the analysis shall be completed within one year of the introduction of the source. Compliance shall be based on the analysis of an annual composite of four consecutive quarterly samples or the average of the analytical results of four samples obtained at quarterly intervals.
 - a. If the gross alpha particle activity exceeds five pCi/L, the same or an equivalent sample shall be analyzed for combined Radium-226 and Radium-228. In localities where the Department has determined that Radium-228 may be present in drinking water, Radium-226 and Radium-228 analyses are required

- when the gross alpha particle activity exceeds two pCi/L.
 - b. If the concentration of Radium-228 is below two pCi/L, a Radium-226 sample may be substituted for future combined Radium-226 and Radium-228 samples, provided that the Radium-226 level is less than three pCi/L.
2. For purposes of future monitoring, when the gross alpha concentration is less than 7.5 pCi/L, analysis of a single sample may be substituted for the quarterly sampling procedures required by paragraph (B)(1) above.
- a. More frequent monitoring shall be conducted in the vicinity of mining or other operations when the Department determines that these operations may contribute alpha particle radioactivity to either surface water or groundwater.
 - b. More frequent monitoring shall be conducted when the Department determines that there is possible radiochemical contamination or that changes in the distribution system or treatment process occur which may increase the concentration of radioactivity in water.
 - c. A CWS using two or more sources having different concentrations of radioactivity shall monitor each source of water in addition to monitoring at a tap when ordered to do so by the Department.
 - d. A water supplier for a CWS shall conduct annual monitoring when the Radium-226 concentration exceeds three pCi/L.
3. If the maximum contaminant level for gross alpha particle activity or total radium as set forth in subsection (A) of this Section is exceeded, quarterly monitoring shall be required until:
- a. The annual average concentration no longer exceeds the maximum contaminant level due to one or more of the following:
 1. Treatment;
 2. Removal of source from service;
 3. An approved blend; or
 - b. A monitoring schedule, which is a condition of a variance, exemption, compliance agreement or an enforcement action has become effective.
4. For a noncommunity water system utilizing surface water or groundwater, analyses for the purpose of determining compliance with subsection (A) of this Section, shall be completed as directed by the Department whenever a health hazard is identified due to a potential contamination of the water system by radiochemicals.
- A. Water distributed by a community water system [CWS] shall not exceed the following maximum contaminant levels:
1. 5 pCi/L for combined radium-226 and radium-228;
 2. 15 pCi/L for gross alpha particle activity, including radium-226 but excluding radon and uranium;
 3. The average annual concentration of man-made beta particle and photon emitters shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year.
 - a. Except for Tritium and Strontium-90, the concentration of man-made beta particle and photon emitters causing 4 millirem total body or organ dose equivalents shall be calculated on the basis of a 2 liter per day drinking water intake using the 168-hour data listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," NBS Handbook 69, U.S. Department of

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Commerce, (as amended August 1963 and no future editions), which is incorporated by reference and on file with the Office of the Secretary of State and the Department.

- b. The following average annual concentrations of Tritium and Strontium-90 are assumed to produce a total body or organ dose of 4 millirem per year:

Radionuclide	Critical organ	pCi/L
Tritium	Total body	20,000
Strontium-90	Bone marrow	8

- c. If 2 or more radionuclides are present, then the sum of their annual dose equivalent to the total body or to any internal organ shall not exceed 4 millirem/year.

B. A CWS shall monitor for gross alpha particle activity, radium-226, and radium-228 as follows:

1. A CWS shall monitor each sampling point as prescribed in R18-4-218 for gross alpha particle activity, radium-226, and radium-228 once every 4 years. Compliance shall be based on the analysis of an annual composite of 4 consecutive quarterly samples or the average of the analytical results of 4 samples obtained at quarterly intervals.

2. A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analyses provided that the measured gross alpha particle activity does not exceed 5 pCi/L at a confidence level of 95 % (1.65σ where σ is the standard deviation of the net counting rate of the sample).

- a. If a gross alpha particle activity measurement exceeds 5 pCi/L, then the same or an equivalent sample shall be analyzed for radium-226. If the concentration of radium-226 exceeds 3 pCi/L, then the same or an equivalent sample shall be analyzed for radium-228.

- b. If a gross alpha particle activity measurement exceeds 15 pCi/L, then the same sample shall be analyzed for uranium and the uranium result shall be subtracted from the gross alpha particle activity measurement to determine compliance with R18-4-217(A)(2).

- c. In localities where radium-228 may be present in drinking water, the Department may require radium-226 and radium-228 analyses when the gross alpha particle activity exceeds two pCi/L.

3. The Department may order a CWS to conduct annual monitoring for gross alpha particle radioactivity, radium-226, or radium-228 at a sampling point if the concentration of radium-226 exceeds 3 pCi/L.

C. If the maximum contaminant level for gross alpha particle activity or combined radium-226 and radium-228 is exceeded, then the CWS shall conduct quarterly monitoring at the sampling point until a monitoring schedule which is a condition of a variance, exemption, compliance agreement, or enforcement action has become effective or the annual average concentration no longer exceeds the maximum contaminant level due to one or more of the following:

1. Treatment;
2. Removal of a source from service; or
3. An approved blending plan.

D. The Department may order a CWS to conduct more frequent monitoring for gross alpha particle activity, radium-226, or radium-228 if the Department determines one of the following:

1. The CWS is in the vicinity of mining or other operations which may contribute alpha particle radioactivity to either surface or groundwater sources of drinking water;

2. There is possible radiochemical contamination of surface or groundwater sources of drinking water; or
3. Changes in the distribution system or treatment process occur which may increase the concentration of radioactivity in water.

E. A CWS may reduce monitoring for radiochemicals as follows:

1. Analysis of a single sample may be substituted for the quarterly sampling procedure prescribed in R18-4-217(B) when an annual record establishes that the average annual concentration is less than half the maximum contaminant levels prescribed in R18-4-217(A).

2. Monitoring to determine compliance with the maximum contaminant level for combined radium-226 and radium-228 need not include radium-228, except where required by the Department, provided that the radium-226 concentration is less than 3 pCi/L and the average annual concentration of radium-228 has been measured at least once using the quarterly monitoring procedure prescribed in R18-4-217(B).

F. A CWS shall conduct quarterly monitoring as prescribed in R18-4-217(B) at the point-of-entry to the distribution system within 1 year of the introduction of a new water source.

G. The Department may order a CWS which uses 2 or more sources that are combined before the point-of-entry into the distribution system and which have different concentrations of radioactivity, to monitor each source and to monitor the blended water at the point-of-entry.

G.H. A CWS shall conduct monitoring for man-made radioactivity as follows:

1. A CWS that is a surface water system which serves more than 100,000 persons and such other CWS as the Department finds is subject to potential health risks from man-made radioactivity shall monitor to determine compliance with the maximum contaminant levels for manmade radioactivity prescribed in subsections (A)(3) and (A)(4) of this Section R18-4-217(A)(3). A CWS shall complete analysis of a composite of ~~four~~ 4 consecutive quarterly samples. Compliance with the maximum contaminant levels for man-made radioactivity may be assumed without further analysis if the annual average concentration of gross beta particle activity is less than 50 pCi/L and if the annual average concentrations of Tritium and Strontium-90 are less than those listed in subsection (A)(4) of this Section R18-4-217(A)(3), provided that, if both radionuclides are present, the sum of their annual dose equivalents to bone marrow shall not exceed ~~four~~ 4 millirem/year.

- a. If the gross beta particle activity exceeds 50 pCi/L, an analysis of the sample shall be performed to identify the major radioactive constituents present and the appropriate internal organ and total body doses shall be calculated to determine compliance with subsections (A)(3) and (A)(4) of this Section R18-4-217(A)(3).

- b. A groundwater system shall be required to monitor for man-made radioactivity if the Department finds that there is possible man-made radioactive contamination or an increased level of such contamination.

2. A water supplier shall repeat the required monitoring for man-made radioactivity at ~~four-year~~ 4-year intervals.

3. The water supplier of a CWS which utilizes water that may be contaminated by effluents from nuclear facilities shall perform quarterly monitoring for gross beta particle and Iodine-131 radioactivity and annual monitoring for Strontium-90 and Tritium.

- a. Quarterly monitoring for gross beta particle activity

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shall be based on the analysis of monthly samples or the analysis of a composite of ~~three~~ 3 monthly samples. If the gross beta particle activity in a sample exceeds 15 pCi/L, the same or an equivalent sample shall be analyzed for Strontium-89 and Cesium-134. If the gross beta particle activity exceeds 50 pCi/L, an analysis of the sample shall be performed to identify the major radioactive constituents present, and the appropriate internal organ and total body doses shall be calculated to determine compliance with the maximum contaminant levels prescribed in subsection (A) of this Section. R18-4-217(A)(3).

- b. For Iodine-131, a composite of ~~five~~ 5 consecutive daily samples shall be analyzed once each quarter. More frequent monitoring shall be conducted at a frequency specified by the Department if Iodine-131 is detected in the finished water.
 - c. Annual monitoring for Strontium-90 and Tritium shall be conducted by means of the analysis of a composite of ~~four~~ 4 consecutive quarterly samples or analysis of ~~four~~ 4 quarterly samples.
 - d. The Department may allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of man-made radioactivity by the water supplier provided the Department determines that such data are applicable to a community water system.
4. If a maximum contaminant level for man-made radioactivity is violated, a CWS shall conduct monthly monitoring until the average concentration for 12 consecutive months no longer exceeds the maximum contaminant level or until a monitoring schedule, which is a condition to a variance, exemption, compliance agreement, or enforcement action, has become effective.
 5. A CWS that is a surface water system that is required to monitor for man-made radioactivity shall conduct monitoring at surface water points-of-entry. A CWS that the Department determines is subject to potential health risk from man-made radioactivity shall conduct monitoring at points-of-entry designated by the Department.

R18-4-218. Sampling Sites

- A. A public water system shall conduct monitoring to determine compliance with maximum contaminant levels at sampling points as follows:
 1. At each ~~point-of-entry~~ point-of-entry to the distribution system that is representative of water from each well after treatment.
 2. At each ~~point-of-entry~~ point-of-entry to the distribution system representative of each surface water source after treatment or in the distribution system at a point located before the first service connection which is representative of each surface water source after treatment.
- B. If a public water system draws water from more than one source and the sources are combined before distribution, the public water system shall sample at points-of-entry to the distribution system during periods of normal operating conditions.
- C. A public water system shall take each sample in subsequent monitoring periods at the same sampling ~~points~~ point unless conditions make another sampling point more representative of water from each source after treatment. If a sampling site is changed in a subsequent monitoring period, then the water supplier shall report the new sampling site to the Department and explain the reason for the change in location.
- D. A public water system shall sample for total coliforms at sampling sites as identified in a written site sampling plan which is subject to Department review and approval.
- E. A CWS shall sample for total trihalomethanes at sampling points as prescribed in R18-4-214.
- F. ~~A CWS shall monitor sources for radiochemicals as prescribed in R18-4-217.~~

R18-4-219. Sample Compositing

- A. A public water system may reduce the total number of samples which must be analyzed to determine compliance with a maximum contaminant level by compositing. Composite samples from a maximum of ~~five~~ 5 samples are allowed provided that the detection limit of the method used for analysis is less than one-fifth of the maximum contaminant level for the contaminant.
- B. Compositing of samples shall be done by a licensed laboratory.
- C. ~~Public water systems serving more than 3300 persons may composite samples from sampling points within a single system. Public water systems serving 3300 or fewer persons may composite samples from sampling points in different public water systems. A public water system may composite up to 5 samples from sampling sites within the same public water system. A public water system serving 3300 or fewer persons may composite samples with samples taken from other public water systems serving 3300 or fewer persons.~~
- D. A public water system shall take follow-up samples if any of the following occurs:
 1. Inorganic chemicals: If the concentration of an inorganic chemical in a composite sample is greater than or equal to one-fifth of the maximum contaminant level, then a follow-up sample shall be taken within 14 days at each sampling point included in the composite sample. The follow-up samples shall be analyzed for any inorganic chemical which exceeded one-fifth of the maximum contaminant level in the composite sample.
 2. Volatile organic chemicals: If any volatile organic chemical in a composite sample is detected in a concentration ≥ 0.0005 mg/L, then a follow-up sample shall be taken within 14 days at each sampling point that was included in the composite sample. The follow-up samples shall be analyzed for the volatile organic chemical that was detected in the composite sample within 14 days of sample collection.
 3. Synthetic organic chemicals: If any synthetic organic chemical in a composite sample exceeds the detection limit for that synthetic organic chemical prescribed in Appendix B, then a follow-up sample shall be taken and analyzed within 14 days from each sampling point included in the composite sample. The follow-up samples shall be analyzed for the synthetic organic chemical that was detected in the composite sample.
 4. If duplicates of the original sample taken from each sampling point used in the composite sample are available, then a public water system may use the duplicates instead of taking follow-up samples. Duplicates shall be analyzed and the results reported to the Department within 14 days of collection.
- E. Special compositing rules:
 1. ~~Asbestos: Samples taken at points of entry to the distribution system shall not be composited with a tap sample.~~
 2. ~~Compositing VOC samples prior to GC analysis:~~
 - a. Add 5 ml or equal larger amounts of each sample (up to ~~five~~ 5 samples are allowed) to a 25 ml glass syringe. Special precautions shall be taken to maintain zero headspace in the syringe. If less than ~~five~~ 5

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- samples are used for compositing, a proportionately smaller syringe may be used.
- b. Samples shall be cooled at 45 $^{\circ}$ C to minimize volatilization losses.
 - c. The composite sample shall be well mixed. A 5 ml aliquot shall be drawn from the composite sample for GC analysis.
 - d. Sample introduction, purging, and desorption steps shall be as prescribed in the approved analytical method.
- 3.2. Compositing samples prior to GC/MS analysis:
- a. Inject 5 ml or equal larger amounts of each aqueous sample (up to 5 samples are allowed) into a 25 ml purging device using the sample introduction technique described in the approved method.
 - b. The total volume in the purging device shall be 25 ml.
 - c. Purge and desorb as prescribed in the approved method.
3. Vinyl chloride samples shall not be composited.
4. Samples which are composited cannot be screened for PCBs using EPA Method 505 or EPA Method 508. Samples that are composited for PCB analysis must be analyzed using EPA Method 508A.
5. Tap water samples for lead and copper shall not be composited. Source water samples for lead may be composited provided the method detection level prescribed in Appendix B for the analytical method used is achieved. Source water samples for copper may be composited provided the method detection level prescribed in Appendix B for the analytical method used is achieved.

ARTICLE 3. TREATMENT TECHNIQUES

R18-4-302. Filtration

- A. A surface water system shall provide filtration.
- B. Conventional or direct filtration: The turbidity level of samples of filtered water from a surface water system that uses conventional filtration or direct filtration shall be less than or equal to 0.5 NTU in at least 95 % of the measurements taken each month. The turbidity level of samples of filtered water shall not exceed five 5 NTUs.
- C. Slow sand filtration: The turbidity level of samples of filtered water from a surface water system using slow sand filtration shall be less than or equal to one 1 NTU in at least 95 % of the measurements taken each month. The turbidity level of samples of filtered water shall not exceed five 5 NTUs.
- D. Diatomaceous earth filtration: The turbidity level of samples of filtered water from a surface water system using diatomaceous earth filtration shall be less than or equal to one 1 NTU in at least 95 % of the measurements taken each month. The turbidity level of samples of filtered water shall not exceed five 5 NTUs.
- E. Other filtration technologies: A surface water system may use a filtration technology other than conventional filtration, direct filtration, slow sand filtration, or diatomaceous earth filtration if the water supplier demonstrates to the Department, through pilot plant studies or other means, that the filtration technology, in combination with disinfection, consistently achieves a 99.9% (3-log) removal and inactivation of *Giardia lamblia* cysts and a 99.99% (4-log) removal and inactivation of viruses. The turbidity level of samples of filtered water from a surface water system that uses a filtration technology other than conventional filtration, direct filtration, slow sand filtration or diatomaceous earth filtration shall be less than or equal to one 1 NTU in at least 95 % of the measurements taken each

month. The turbidity level of samples of filtered water shall not exceed five 5 NTUs.

- F. A surface water system shall monitor the turbidity of filtered water as follows:
 1. Turbidity measurements shall be performed on samples of filtered water at least once every four 4 hours that a water treatment plant is operating.
 - a. A surface water system may substitute continuous turbidity monitoring for grab sample monitoring provided continuous turbidity monitoring equipment is calibrated regularly in accordance with the manufacturer's specifications.
 2. Filtered water turbidity shall be measured at one of the following locations:
 - a. Combined filter effluent prior to entry into a clearwell;
 - b. Clearwell effluent;
 - c. Water treatment plant effluent; or
 - d. Another location that is approved by the Department.
 3. Upon the written request of a water supplier, the Department may reduce the frequency of grab sampling by a surface water system using slow sand filtration or a filtration technology other than conventional filtration, direct filtration, or diatomaceous earth filtration to once per day if the Department determines that less frequent turbidity monitoring is sufficient to indicate effective filtration performance. The Department's decision to allow less frequent turbidity monitoring shall be in writing.
 4. Upon the written request of a water supplier, the Department may reduce the frequency of grab sampling by a surface water system that serves 500 or fewer persons to once per day, regardless of the type of filtration used, if the Department determines that less frequent turbidity monitoring is sufficient to indicate effective filtration performance. The Department's decision to allow less frequent turbidity monitoring shall be in writing.

R18-4-303. Disinfection

- A. A surface water system shall provide disinfection sufficient to ensure that the total treatment processes of the system achieve at least a 99.9 % (3-log) inactivation and removal of *Giardia lamblia* cysts and at least a 99.99 % (4-log) inactivation and removal of viruses. ~~A water supplier shall submit a treatment technique compliance study to the Department which demonstrates that the total treatment processes of the surface water system achieve the *Giardia lamblia* and virus removal and inactivation rates prescribed in this subsection. The water supplier shall submit an additional treatment technique compliance study if there is a change in the treatment process which may affect the percent removal or inactivation of *Giardia lamblia* cysts or viruses or an additional or different source is developed.~~
- B. The residual disinfectant concentration in water entering the distribution system (measured as free chlorine, combined chlorine or chlorine dioxide) shall be not less than 0.2 mg/L for more than four 4 consecutive hours.
 1. A surface water system that serves more than 3,300 persons per day shall continuously monitor the residual disinfectant concentration in water entering the distribution system. If there is a failure of the continuous monitoring equipment, then a surface water system shall conduct grab sampling every four 4 hours. A surface water system shall repair or replace the continuous monitoring equipment within five 5 days of initial failure.
 2. A surface water system that serves 3,300 or fewer persons per day may take grab samples to monitor the resid-

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ual disinfectant concentration in water entering the distribution system instead of continuous monitoring.

- a. If grab samples are taken, a surface water system shall sample each day at the following frequency:

System size by population	Number of grab samples/day ¹
500 or less	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

¹ Grab samples shall not be taken at the same time. Sampling intervals are subject to Department review and approval.

- b. If the residual disinfectant concentration in a grab sample is below 0.2 mg/l, then a surface water system shall increase the frequency of grab sampling to once every four 4 hours. The surface water system shall continue to take a grab sample every four 4 hours until the residual disinfectant concentration in water entering the distribution system is greater than or equal to 0.2 mg/L.

- c. The residual disinfectant concentration of water in the distribution system (measured as total chlorine, free chlorine, combined chlorine or chlorine dioxide) shall be detectable in 95 % or more of the samples each month for any two 2 consecutive months that a surface water system serves water to the public.

1. Heterotrophic bacteria in the distribution system, as heterotrophic plate count (HPC), may be measured in lieu of the residual disinfectant concentration in water in the distribution system. Water in the distribution system with a heterotrophic bacteria concentration that is less than or equal to 500/ml (measured as HPC) is deemed to have a detectable residual disinfectant concentration.
2. To determine whether there is a detectable residual concentration in water in the distribution system in 95 % of the samples taken each month, the value "V" in the following formula shall be calculated. The value "V" shall not exceed five 5 in each month for any two 2 consecutive months:

$$V = \frac{c + d + e}{a + b} \times 100$$

Where:

- a = Number of instances where the residual disinfectant concentration is measured;
b = Number of instances where the residual disinfectant concentration is not measured but HPC is measured;
c = Number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;
d = Number of instances where no residual disinfectant concentration is detected and where the HPC is greater than 500/ml; and
e = Number of instances where the residual disinfectant concentration is not measured and HPC is greater than 500/ml.

3. The residual disinfectant concentration in water in the distribution system shall be measured at the same sampling sites and at the same time as total coliform sampling.

- d. A water supplier shall submit a treatment technique compliance study to the Department which demonstrates that the total treatment processes of the surface water system achieve the *Giardia lamblia* and virus removal and inactivation rates prescribed in this subsection. The water supplier shall submit an additional treatment technique compliance study if there is a change in the treatment process which may affect the percent

removal or inactivation of *Giardia lamblia* cysts or viruses or an additional or different source is developed.

R18-4-307. Lead and Copper; Requirements for Small and Medium Water Systems

- A. Except as provided in subsection (B) of this Section R18-4-307(B), small and medium water systems shall complete the following treatment technique steps within the indicated time periods:

1. A small or medium water system shall conduct initial tap water monitoring for lead and copper for ~~two 2~~ consecutive ~~six-month 6-month~~ monitoring periods or until the system exceeds a lead or copper action level.
2. A small or medium water system that exceeds an action level for lead or copper shall conduct water quality parameter monitoring as prescribed in R18-4-311. A small or medium water system shall complete monitoring for water quality parameters in the same ~~six-month~~ monitoring period during which the system exceeds the action level for lead or copper.
3. A small or medium water system which exceeds an action level for lead or copper shall recommend optimal corrosion control treatment to the Department ~~in the six-month monitoring period immediately following the~~ within 6 months of completion of the six-month monitoring period in which the system exceeded the action level for lead or copper.
4. Within a year after completion of the ~~six-month~~ monitoring period in which a small or medium water system exceeded an action level for lead or copper, the Department shall determine whether to require the small or medium water system to perform a corrosion control study. If the Department requires a small or medium water system to perform a corrosion control study, then the system shall complete and submit the study to the Department within 18 months of the date that the Department determines that a corrosion control study is necessary ~~and submit the study to the Department~~. The Department shall designate the optimal corrosion control treatment for the small or medium water system within ~~six 6~~ months of the date of submittal of the corrosion control study.
5. If the Department does not require a small or medium water system to perform a corrosion control study, the Department shall designate optimal corrosion control treatment for the system within the following time-frames:
 - a. For medium water systems, within 18 months after the system exceeds an action level for lead or copper; or
 - b. For small water systems, within 24 months after the system exceeds an action level for lead or copper.
6. A small or medium water system shall install optimal corrosion control treatment within 24 months after the Department designates ~~such optimal corrosion control treatment for the system~~.
7. A small or medium water system shall complete follow-up tap water monitoring for lead and copper and follow-up monitoring for water quality parameters, as prescribed in R18-4-313, within 36 months after the Department designates optimal corrosion control treatment.
8. The Department shall designate water quality parameters for optimal corrosion control within ~~six 6~~ months of completion of follow-up monitoring.
9. A small or medium water system shall operate in compliance with the designated water quality parameters for

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optimal corrosion control and continue to conduct follow-up tap water monitoring for lead and copper and follow-up monitoring for water quality parameters as prescribed in R18-4-313.

- B. A small or medium water system is deemed to have optimized corrosion control and is not required to complete the treatment technique steps identified in ~~subsection (A) of this Section R18-4-307(A)~~ if the small or medium water system satisfies one of the following criteria:

1. A small or medium water system does not exceed the action levels for lead or copper during each of ~~two 2 consecutive six-month 6-month~~ monitoring periods.
2. A small or medium water system demonstrates to the Department that it has conducted corrosion control activities that are equivalent to the corrosion control steps prescribed in subsection (A). ~~If the Department makes an equivalency determination, the~~ The Department shall provide written notice to the small or medium water system which explains the basis for ~~its any equivalency determination.~~ The Department shall designate the water quality parameters ~~representing which represent~~ optimal corrosion control for the small or medium water system. A small or medium water system shall provide the following information to the Department to support a request for an equivalency determination:
 - a. The results of all samples collected for lead, copper, pH, alkalinity, calcium, conductivity, water temperature, orthophosphate [when an inhibitor containing a phosphate compound is used] and silicate [when an inhibitor containing a silicate compound is used] before and after evaluation of corrosion control treatment.
 - b. A report which explains the test methods used by the small or medium water system to evaluate the effectiveness of each of the following corrosion control treatments:
 1. Alkalinity and pH adjustment;
 2. Calcium hardness adjustment; and
 3. The addition of a phosphate or silicate-based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples. The report shall include the results of all tests conducted and the basis for the small or medium water system's selection of optimal corrosion control treatment;
 - c. A report which explains how corrosion control treatment has been installed and how it is being maintained to ensure minimal lead and copper concentrations at taps; and
 - d. The results of tap water monitoring samples for lead and copper collected in accordance with requirements prescribed at R18-4-310. A small or medium water system shall conduct tap water monitoring for lead and copper once every ~~six 6~~ months for at least ~~one 1~~ year after corrosion control treatment has been installed.
3. A small or medium water system is deemed to have optimized corrosion control if the system submits the results of tap water monitoring for lead and copper conducted in accordance with R18-4-310 and source water monitoring conducted in accordance with R18-4-314 which demonstrate that for ~~two 2 consecutive six-month 6-month~~ monitoring periods, the difference between the 90th percentile tap water lead level, as computed according to R18-4-308, and the highest source water lead concentration is less than 0.005 mg/L.

- C. Any small or medium water system that is required to complete the corrosion control steps prescribed in ~~subsection (A) R18-4-307(A)~~ because of an exceedance of an action level for lead or copper may cease completing the steps whenever the system does not exceed the action levels for lead or copper during each of ~~two 2 consecutive six-month 6-month~~ monitoring periods and submits the analytical results to the Department. If a small or medium water system thereafter exceeds an action level for lead or copper during any monitoring period, the system (or the Department) shall recommence completion of the applicable corrosion control steps, beginning with the first step which was not previously completed in its entirety. The Department may require a small or medium water system to repeat steps previously completed by the system where the Department determines that repeating a step is necessary to implement properly the corrosion control requirements of this Section. The Department shall notify the small or medium water system in writing of such a determination and explain the basis for its decision.
- D. The requirement for any small or medium water system to implement corrosion control treatment steps if an action level for lead or copper is exceeded includes small and medium water systems which are been deemed to have optimized corrosion control treatment under ~~subsection (B)(1) of this Section R18-4-307(B)(1)~~ and which thereafter exceed an action level for lead or copper.
- E. A small or medium water system which exceeds an action level for lead or copper shall conduct source water monitoring as prescribed in R18-4-314.
- F. A small or medium water system which exceeds the action level for lead after implementation of corrosion control treatment or source water treatment shall comply with the lead service line replacement requirements prescribed in R18-4-315.
- G. A small or medium water system which exceeds the action level for lead shall comply with the public education requirements for lead prescribed in R18-4-316.

R18-4-310. Lead and Copper; Initial Tap Water Monitoring ~~for Lead and Copper~~

- A. Each large, medium, and small water system shall conduct tap water monitoring for lead and copper as follows:
1. Each large water system shall conduct initial tap water monitoring for lead and copper during ~~two 2 consecutive six-month 6-month~~ monitoring periods.
 2. Each small and medium water system shall conduct initial tap water monitoring for lead and copper during ~~two 2 consecutive six-month 6-month~~ monitoring periods ~~unless the small or medium water system exceeds an action level for lead and copper during the first six-month monitoring period.~~ If a small or medium water system exceeds an action level for lead and copper in the ~~first six-month a~~ monitoring period, then the system shall implement corrosion control treatment steps as prescribed in R18-4-307(A)(2-9).
- B. The first six-month monitoring period for large, medium, and small water systems shall begin on the following dates:
- | System size by number of people served | First 6-month monitoring period begins on: |
|--|--|
| > 50,000 [large water systems] | January 1, 1992 |
| 3,301 to 50,000 [medium water systems] | July 1, 1992 |
| ≤ 3,300 [small water systems] | July 1, 1993 |
- C. Each large, medium, and small water system shall collect one tap water sample for lead and copper from the following num-

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ber of sampling sites during each ~~six-month~~ monitoring period:

System size (by population)	Number of samples
>100,000	100
10,001 to 100,000	60
3,301 to 10,000	40
501 to 3,300	20
101 to 500	10
≤ 100	5

D. All tap water samples for lead and copper, with the exception of lead service line samples, shall be first-draw samples.

1. Each first-draw tap water sample for lead and copper shall be ~~one~~ 1 liter in volume and shall have stood motionless in the plumbing system of each sampling site for at least six hours. First-draw samples from residential housing shall be collected from the cold-water kitchen tap or bathroom sink tap. First-draw samples from a non-residential building shall be collected at an interior tap from which water is typically drawn for consumption. First-draw samples may be collected by the system or the system may allow residents to collect first-draw samples after providing instructions to the residents on proper sampling procedures. If a system allows residents to perform sampling, the system may not challenge the accuracy of the sampling results based on alleged errors in sample collection.
2. Each lead service line sample shall be ~~one~~ 1 liter in volume and shall have stood motionless in the lead service line for at least ~~six~~ 6 hours. Lead service line samples shall be collected in one of the following three ways:
 - a. At a tap after flushing the volume of water between the tap and the lead service line. The volume of water that is flushed shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line;
 - b. Tapping directly into the lead service line; or
 - c. If the sampling site is a building constructed as a single-family residence, allowing the water to run until there is a significant change in temperature which would be indicative of water that has been standing in the lead service line.
3. A water system shall collect each first-draw tap water sample in subsequent monitoring periods from the same sampling site from which it collected a previous sample. If a system cannot gain entry to a sampling site in order to collect a follow-up tap water sample, the system may collect the follow-up tap water sample from another sampling site in its sampling pool as long as the new site meets the same targeting criteria and is within reasonable proximity of the original sampling site.

E. A small or medium water system which does not exceed an action level for lead or copper in the initial ~~six-month~~ 6-month monitoring period shall continue tap water monitoring for another consecutive ~~six-month~~ 6-month monitoring period. If the small or medium water system does not exceed the action level for lead and copper in ~~two~~ 2 consecutive ~~six-month~~ 6-month monitoring periods, then the system may make a written request to the Department to reduce the frequency of tap water monitoring for lead and copper to once per year. The small or medium water system also may request a reduction in the number of samples taken as prescribed in ~~subsection (E)(1)~~ R18-4-310(E)(1) below.

1. A small or medium water system conducting reduced monitoring shall collect the following number of samples per year:

System size (Number of persons)	Number of samples
---------------------------------	-------------------

served)	
10,001 - 50,000	30
3,301 - 10,000	20
501 - 3,300	10
101 - 500	5
≤ 100	5

2. A small or medium water system that does not exceed the action levels for lead and copper for ~~three~~ 3 consecutive years of monitoring may submit a written request to the Department to further reduce the frequency of tap water monitoring for lead and copper to once every ~~three~~ 3 years. A small or medium water system which samples annually or less frequently shall conduct tap water monitoring for lead and copper during the months of June, July, August, or September ~~in the same calendar year~~.
3. A small or medium water system that reduces the frequency of monitoring and the number of samples taken shall collect samples from sites included in the pool of targeted sampling sites.
4. If a small or medium water system that is subject to reduced monitoring exceeds an action level for lead or copper, ~~then~~ the system shall resume tap water monitoring at the frequency specified in ~~subsection (A) of this Section R18-4-310(A)~~ and collect the number of samples specified in ~~subsection (C) of this Section R18-4-310(C)~~.

F. The results of tap water monitoring for lead and copper conducted by systems in addition to the minimum requirements of this Section shall be considered by the system and the Department in making any treatment technique determinations required by this Article.

G. A small or medium water system which exceeds an action level for lead or copper ~~in any six-month monitoring period~~, shall comply with the following:

1. Water quality parameter monitoring requirements prescribed at R18-4-311.
2. Source water monitoring requirements prescribed at R18-4-314;
3. A small or medium water system which exceeds the action level for lead ~~in any six-month monitoring period~~ shall comply with the lead public education requirements prescribed at R18-4-316;

H. A large water system which exceeds an action level for lead or copper ~~in any six-month monitoring period~~, shall comply with the following:

1. Source water monitoring requirements prescribed at R18-4-314;
2. A large water system which exceeds the action level for lead shall comply with the lead public education requirements prescribed in R18-4-316;
3. A large water system which exceeds the action level for lead after installation of corrosion control treatment and source water treatment shall comply with the lead service line replacement requirements prescribed in R18-4-315.

I. A large, medium, or small water system that exceeds the action level for lead shall offer to sample the tap water of any customer who requests it. The system is not required to pay for the collection or analysis of the sample. Any sample that is collected pursuant to this paragraph shall not be used for purposes of determining compliance.

R18-4-311. Lead and Copper; Initial Monitoring for Water Quality Parameters

- A. Each large water system shall conduct initial monitoring for water quality parameters, regardless of whether an action level for lead or copper is exceeded. Each small and medium water system shall conduct initial monitoring for water quality parameters only if the system exceeds an action level for lead

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or copper. ~~Initial monitoring~~ Monitoring for water quality parameters includes both tap water monitoring and source water monitoring.

- B. Each large, medium, or small water system ~~and each medium or small water system~~ that is required to conduct monitoring for water quality parameters shall collect samples for the following water quality parameters:

1. pH (at the time of sample collection);
2. Alkalinity;
3. Calcium;
4. Conductivity;
5. Water temperature (at the time of sample collection);
6. Orthophosphate [when a phosphate-based corrosion inhibitor is used];
7. Silica [when a silicate-based corrosion inhibitor is used].

- C. Tap water samples for water quality parameters shall be representative of water quality throughout the distribution system, taking into account the number of persons served, the different sources of water, the different treatment methods employed by the system and seasonal variability. Tap water samples for water quality parameters need not be taken from the same locations as tap water samples for lead and copper. Tap water samples for water quality parameters may be taken at the same sampling sites used for total coliform sampling. Source water samples for water quality parameters shall be taken at sampling points as prescribed in R18-4-218.

- D. Each large, medium, and small water system shall collect ~~two~~ 2 tap water samples for water quality parameters during each six-month monitoring period from the following number of taps:

<u>System Size (number of people served)</u>	<u>Number of Sites</u>
> 100,000	25
10,001-100,000	10
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
≤ 100	1

- E. Each large, medium, and small water system shall collect ~~two~~ 2 source water samples for water quality parameters at each sampling point as prescribed in R18-4-218 during each monitoring period.

- F. Each large water system is required to conduct initial monitoring for water quality parameters at taps and at each sampling point during each of ~~two~~ 2 consecutive ~~six-month~~ 6-month monitoring periods. A small or medium-size water system shall conduct monitoring for water quality parameters only if the system exceeds an action level for lead or copper. A small or medium water system shall complete tap water and source water monitoring for water quality parameters in the same ~~six-month~~ monitoring period during which the system exceeds an action level for lead or copper.

- G. Based upon the results of tap water monitoring for lead and copper and monitoring for water quality parameters, a small or medium water system which exceeds an action level for lead or copper shall recommend installation of one or more of the corrosion control treatments listed in this subsection which the small or medium water system believes constitutes optimal corrosion control. Each small or medium water system shall make a recommendation on optimal corrosion control to the Department within six months of completion of the ~~six-month~~ monitoring period during which the action level was exceeded. The Department may require that a small or medium water system conduct additional monitoring for water quality parameters to assist the Department in reviewing the system recommendation. Optimal corrosion control treatments include:
1. Alkalinity and pH adjustment;

2. Calcium hardness adjustment; and
3. The addition of a phosphate or silicate-based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.

- H. Based upon available information, including a small or medium water system's recommendation on optimal corrosion control treatment, the Department shall, in writing, either approve the corrosion control treatment recommended by the system, designate a different optimal corrosion control treatment for the system or require that the small or medium water system conduct a corrosion control study to identify the optimal corrosion control treatment for the system. If the Department makes the determination that a corrosion control study is not necessary, then the Department shall designate the optimal corrosion control treatment for the system within the following time frames:

1. For medium water systems, within 18 months after the system exceeds the lead or copper action level; or
2. For small water systems, within 24 months after the system exceeds the lead or copper action level.

- I. The results of any additional monitoring for water quality parameters conducted by a system in addition to the minimum requirements prescribed in this Section shall be considered by the system and the Department in making recommendations regarding corrosion control treatment, performance of a corrosion control study, designation of optimal corrosion control treatment or water quality parameters for optimal corrosion control or modification of an optimal corrosion control treatment decision.

R18-4-314. Lead and Copper; Source Water Monitoring and Treatment

- A. A large, medium, or small water system which exceeds an action level for lead or copper shall conduct source water monitoring for lead or copper.

- B. Source water monitoring for lead or copper shall be conducted at sampling points as prescribed in R18-4-218. A system may reduce the total number of samples which must be analyzed by compositing as prescribed by R18-4-219.

- C. A large, medium, or small water system which exceeds an action level for lead or copper shall collect one sample from each sampling point within ~~six~~ 6 months of completion of the ~~six-month~~ monitoring period in which there was an exceedance of the action level for lead or copper.

- D. Within ~~six~~ 6 months after the ~~six-month~~ monitoring period in which a large, medium, or small water system exceeds an action level for lead or copper, the system shall make a written recommendation to the Department as to whether one of the source water treatments listed in this subsection (G) is necessary. The system may recommend that no source water treatment be installed based upon a demonstration that source water treatment is not necessary to minimize lead or copper levels at taps.

- E. The Department shall complete an evaluation of the results of all source water samples submitted by a large, medium, or small water system to determine whether source water treatment is necessary to minimize lead or copper levels in water delivered to taps. The Department shall make a written determination on whether source water treatment is necessary within ~~six~~ 6 months after submission of source water monitoring results.

- F. Where the Department determines that a large, medium, or small water system is not required to install source water treatment, the system shall conduct source water monitoring at one of the following frequencies:

1. A large, medium, or small water system that is a ground-water system shall collect source water samples for lead

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- or copper once during each compliance period, beginning in the compliance period that the Department determines that source water treatment is unnecessary.
2. A large, medium, or small water system that is a surface water system shall collect source water samples for lead or copper annually. The first annual monitoring period shall begin on the date that the Department determines that source water treatment is unnecessary.
- G. If the Department requires installation of source water treatment, a large, medium, or small water system shall install the treatment within 24 months of the date that the Department makes a determination that source water treatment is necessary. Each system shall properly install and operate the source water treatment that is approved or designated by the Department. The Department shall either require installation and operation of the source water treatment recommended by the system or require the installation and operation of another source water treatment from among the following:
1. Ion exchange,
 2. Reverse osmosis,
 3. Lime softening, or
 4. Coagulation / filtration.
- H. The Department may request additional information from a large, medium, or small water system to aid in its source water treatment determination. If additional information is requested, then a water system shall provide the information by the date specified by the Department in its request. The Department shall notify a large, medium, or small water system, in writing, of its source water treatment determination and set forth the basis for its decision.
- I. A large, medium, or small water system that is required to install source water treatment shall complete follow-up tap water monitoring for lead and copper and follow-up source water monitoring for lead and copper within 36 months of the date that the Department determines that source water treatment is necessary.
- J. The Department shall review a large, medium, or small water system's installation and operation of source water treatment and designate maximum permissible levels for lead or copper within six months after the completion of follow-up monitoring. The Department shall review the source water samples taken by the system both before and after the system installs source water treatment to determine whether the system has properly installed and operated the source water treatment designated by the Department. Based upon its review, the Department shall designate the maximum permissible levels for lead or copper. Such levels shall reflect the contaminant removal capability of the source water treatment when it is properly operated and maintained. The Department shall provide written notice to the system and explain the basis for its decision.
- K. A large, medium, or small water system shall operate in compliance with the Department-designated maximum permissible levels for lead or copper and shall continue source water monitoring. A system shall monitor at the frequency specified below in cases where the Department designates maximum permissible levels:
1. A groundwater system shall collect ~~one~~ 1 sample from each sampling point once during each compliance period, beginning in the compliance period that the Department designates maximum permissible levels for lead or copper.
 2. A surface water system shall collect ~~one~~ 1 sample annually from each sampling point. The first monitoring period shall begin on the date that the Department specifies maximum permissible levels for lead or copper.
- L. Each large, medium, or small water system shall maintain lead or copper levels below the maximum permissible levels designated by the Department at each sampling point. A system is out of compliance with this paragraph if the level of lead or copper at any sampling point is greater than the maximum permissible level designated by the Department.
- M. A large, medium, or small water system is not required to conduct additional source water monitoring for lead or copper if the system does not exceed the action level for lead or copper during the entire source water sampling period applicable to the system under subsection (F)(1) or (F)(2) of this section.
- N. ~~A large, medium, or small water system shall report the sampling results for all source water samples within the first 10 days following the end of each source water monitoring period (i.e., annually, per compliance period, per compliance cycle).~~
- O. ~~If a sampling site is changed in a subsequent monitoring period, a large, medium, or small water system shall report the new sampling point to the Department and include an explanation of why the sampling point has changed.~~
- P-N. Upon its own initiative or in response to a written request by a large, medium, or small water system or other interested party, the Department may modify its source water treatment determination or designation of maximum permissible lead and copper concentrations for water entering the distribution system. A request for modification by a large, medium, or small water system or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The Department may modify its determination where it concludes that such change is necessary to ensure that the system continues to minimize lead and copper concentrations in source water. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the Department's decision and provide an implementation schedule for completing the source water treatment modifications.
- Q-Q. Where the results of sampling indicate an exceedance of maximum permissible levels for lead or copper, the Department may require that ~~one~~ 1 confirmation sample be collected as soon as possible after the initial sample was taken, but not to exceed ~~two~~ 2 weeks, at the same sampling point. If a Department-required confirmation sample is taken for lead or copper, then the results of the initial and confirmation sample shall be averaged in determining compliance with the Department-specified maximum permissible levels.
- R-P. The Department may reduce source water monitoring after designation of maximum permissible levels as follows:
1. A groundwater system which demonstrates that water entering the distribution system has been maintained below the maximum permissible level for lead or copper designated by the Department for ~~three~~ 3 consecutive compliance periods may reduce the monitoring frequency for lead or copper to once during each subsequent compliance cycle.
 2. A surface water system which demonstrates that water entering the distribution system has been maintained below the maximum permissible level for lead or copper designated by the Department for ~~three~~ 3 consecutive years may reduce the monitoring frequency to once during each subsequent compliance cycle.
 3. A water system that uses a new source is not eligible for reduced monitoring for lead or copper until concentrations in samples collected from the new source during ~~three~~ 3 consecutive monitoring periods are below the maximum permissible levels for lead or copper specified by the Department.

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R18-4-316. Public Education Requirements for Lead

- A. A community water system [CWS] that exceeds the action level for lead based on the analytical results of tap water monitoring ~~in a six-month monitoring period~~ shall, within 60 days:
1. Insert a notice on each customer's water utility bill which states in large print: "Some homes in this community have elevated lead levels in their drinking water. Lead can pose a significant risk to your health. Please read the enclosed notice for further information."
 2. Include with each customer's water utility bill a notice which includes the text contained in Appendix C of this Chapter;
 3. Provide the text contained in Appendix C of this Chapter to the editorial departments of the major daily and weekly newspapers circulated throughout the community.
 4. Deliver pamphlets or brochures that contain the public education materials related to the health effects of lead and steps that can be taken to reduce lead exposure prescribed in Appendix C of this Chapter to facilities and organizations, including the following:
 - a. Public schools and/or local school boards,
 - b. City or county health department or environmental quality departments,
 - c. Women, Infants, and Children [WIC] and Head Start program(s) whenever available,
 - d. Public and private hospitals and clinics,
 - e. Pediatricians,
 - f. Family planning clinics, and
 - g. Local welfare agencies.
 5. Submit a public service announcement to at least five of the radio and television stations with the largest audiences that broadcast to the community served by the community water system. The public service announcement shall contain the following language:

"Why should everyone want to know the facts about lead and drinking water? Because unhealthy amounts of lead can enter drinking water through the plumbing in your home. That's why I urge you to do what I did. I had my water tested for [insert free or \$ per sample]. You can contact the [insert the name of the city or water system] for information on testing and on simple ways to reduce your exposure to lead in drinking water. To have your water tested for lead, or to get more information about this public health concern, please call [insert the phone number of the city or water system]."
- B. A CWS shall repeat the tasks contained in subsection (A)(1) through (4) every 12 months and the public service announcement prescribed in subsection (A)(5) every 6 months for as long as the system exceeds the lead action level.
- C. A nontransient, noncommunity water system [NTNCWS] that exceeds the lead action level based on the analytical results of tap water samples ~~in a six-month monitoring period~~ shall, within 60 days, deliver the public education materials contained in the Introduction, health effects, and steps to reduce lead exposure ~~Health Effects, and Steps to Reduce Lead Exposure paragraphs~~ prescribed in Appendix C of this Chapter as follows:
1. Post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system; and
 2. Distribute informational pamphlets or brochures on lead in drinking water to each person served by the nontransient, noncommunity water system.

- D. A NTNCWS shall repeat the public education tasks contained in subsection (C) above at least once during each calendar year for as long as the system exceeds the lead action level.
- E. A CWS or NTNCWS shall include the lead public education text prescribed in Appendix C in all of the printed materials it distributes through its lead public education program. Any additional information presented by a system shall be consistent with the information contained in Appendix C and be written in plain language that can be understood by persons served by the system. Where appropriate, public education materials shall be multilingual.
- F. A CWS or NTNCWS may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month monitoring period conducted. A CWS or NTNCWS shall recommence public education in accordance with this Section if it subsequently exceeds the lead action level ~~during any six-month monitoring period~~.
- G. By December 31st of each year, any CWS or NTNCWS that is subject to the public education requirements in this Section shall submit a letter to the Department demonstrating that the system has delivered the public education materials that meet the content requirements and the delivery requirements prescribed in this Section. The letter shall include a list of all the newspapers, radio stations, television stations, facilities and organizations to which the system delivered public education materials during the previous year. A CWS or NTNCWS shall submit the letter required by this paragraph annually for as long as the system exceeds the lead action level.

ARTICLE 4. SPECIAL MONITORING REQUIREMENTS

R18-4-402. Special Monitoring for Sodium

- A. Each community water system [CWS] shall conduct monitoring for sodium.
- B. Each CWS shall collect ~~one~~ 1 sample per water treatment plant. The minimum number of samples required to be taken by the CWS shall be based on the number of water treatment plants used by the CWS, except that multiple wells drawing raw water from a single aquifer may, with Department approval, be considered one treatment plant for purposes of determining the minimum number of sodium samples required. ~~The Department may require a water supplier to collect and analyze water samples more frequently in locations where the sodium content is variable.~~
- C. Each CWS shall collect and analyze ~~at least one~~ 1 sample annually for each water treatment plant utilizing surface water sources, in whole or in part. A CWS shall collect and analyze ~~at least one~~ 1 sample every ~~three~~ 3 years for each water treatment plant utilizing only groundwater sources. ~~The Department may require a water supplier to collect and analyze water samples more frequently in locations where the sodium content is variable.~~

R18-4-403. Special Monitoring for Water Corrosivity Characteristics

- ~~A. Each community water system [CWS] shall conduct a one-time round of monitoring to determine water corrosivity characteristics.~~
- ~~B. A CWS shall conduct monitoring to determine water corrosivity characteristics at a point of entry to the distribution system from each water treatment plant.~~
- ~~C. A CWS shall collect two samples for each water treatment plant utilizing a surface water source, in whole or in part. One sample shall be collected in mid-summer and one in mid-winter. A CWS shall collect one sample for each water treatment plant utilizing a groundwater source. The minimum number of samples to be taken for water corrosivity characteristics~~

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shall be based upon the number of water treatment plants used by the CWS, except that multiple wells drawing water from a single aquifer may, with Department approval, be considered one water treatment plant for the purpose of determining the minimum number of samples required.

- D. The determination of water corrosivity characteristics shall include measurement of the pH, calcium hardness, alkalinity, temperature, total dissolved solids (total filterable residue) and calculation of the Langelier Index. The Department may require more frequent monitoring or monitoring for additional parameters which may indicate water corrosivity characteristics, such as sulfates and chlorides.
- F. A CWS shall identify and report to the Department whether the following construction materials are present in their distribution system:
1. Lead from piping, solder, caulking, interior lining of distribution mains, alloys, and home plumbing.
 2. Copper from piping and alloys, service lines, and home plumbing.
 3. Galvanized piping, service lines, and home plumbing.
 4. Ferrous piping materials, such as cast iron and steel.
 5. Asbestos-cement pipe.
 6. Vinyl lined asbestos-cement pipe.
 7. Coal tar lined pipes and tanks.

R18-4-403. Special Monitoring for Nickel

- A. Each community water system and nontransient, noncommunity water system shall conduct monitoring for nickel.
- B. Each CWS and NTNCWS shall conduct monitoring for nickel at each sampling point as prescribed in R18-4-218.
- C. A CWS or NTNCWS may composite samples for nickel as prescribed in R18-4-219.
- D. Each CWS and NTNCWS shall conduct monitoring for nickel at the following frequencies:
1. Each CWS and NTNCWS shall take 1 sample at each groundwater sampling point once every 3 years.
 2. Each CWS and NTNCWS shall take 1 sample at each surface water sampling point annually.
- E. A water supplier may request a reduction in the monitoring frequency for nickel as follows:
1. Groundwater sampling points: The Department may reduce monitoring frequency at a groundwater sampling point from once every 3 years to a less frequent basis if a public water system has monitored for nickel at least once every 3 years for 9 years at the groundwater sampling point and all previous analytical results are below 0.1 mg/L.
 2. Surface water sampling points: The Department may reduce monitoring frequency at a surface water sampling point from annually to a less frequent basis if a surface water system has monitored annually at the surface water sampling point for at least 3 consecutive years and all previous analytical results for nickel are below 0.1 mg/L.
 3. The Department may reduce monitoring frequency for nickel for a term not to exceed 9 years.
 4. A CWS or NTNCWS shall take at least 1 sample for nickel during the term of reduced monitoring.
 5. In determining the appropriate reduced monitoring frequency at a sampling point, the Department shall consider the following factors:
 - a. Reported concentrations of nickel from all previous monitoring;
 - b. The degree of variation in the reported concentrations of nickel; and
 - c. Other factors that may affect the concentration of nickel such as changes in groundwater pumping rates, changes in the configuration of the CWS or

NTNCWS, or changes in operating procedures, stream flows, or source water characteristics.

6. A decision by the Department to reduce monitoring frequency for nickel at a sampling point shall be in writing and shall set forth the grounds for the decision. A water supplier may make a written request for reduced monitoring or reduced monitoring may be granted on the Department's initiative. A water supplier shall provide documentation of analytical results which supports a request for reduced monitoring. When a CWS or NTNCWS submits new data or when other data relevant to the public water system's appropriate monitoring frequency becomes available, the Department shall review that data and, where appropriate, revise its determination of appropriate monitoring frequency.
7. A CWS or NTNCWS which uses a new source is not eligible for reduced monitoring until 3 consecutive rounds of monitoring from the new source have been completed.

ARTICLE 5. MINIMUM DESIGN CRITERIA

R18-4-504. Prohibition on the Use of Lead Pipe, Solder, and Flux

Construction materials used in the public water system, including residential and non-residential facilities connected to the public water system, shall be lead-free as defined at R18-1-101(43) R18-4-101(47). This subsection shall not apply to leaded joints necessary for the repair of cast iron pipes.

Appendix A. Mandatory Health Effects Language

1. No change.
2. No change.
3. No change.
4. No change.
5. No change.
6. No change.
7. No change.
8. No change.
9. No change.
10. No change.
11. No change.
12. No change.
13. No change.
14. No change.
15. No change.
16. No change.
17. No change.
18. No change.
19. No change.
20. No change.
21. No change.
22. No change.
23. No change.
24. No change.
25. No change.
26. No change.
27. No change.
28. No change.
29. No change.
30. No change.
31. No change.
32. No change.
33. No change.
34. No change.
35. No change.
36. No change.
37. No change.

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38. No change.
 39. No change.
 40. No change.
 41. No change.
 42. No change.
 43. No change.
 44. No change.
 45. No change.
 47. No change.
 48. No change.
 49. No change.
 (50) ~~Nickel. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that nickel poses a health concern at certain levels of exposure. This inorganic metal occurs naturally in soils, groundwater, and surface waters and is often used in electroplating, stainless steel, and alloy products. It generally gets into water from mining and refining operations. This chemical has been shown to damage the heart and liver in laboratory animals when the animals are exposed to high levels over their lifetimes. EPA has set the drinking water standard at 0.1 parts per million (ppm) for nickel to protect against the risk of these adverse effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to nickel.~~
 (51) No change.
 (52) **Nitrite.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that nitrite poses and acute health concern at certain levels of exposure. This inorganic chemical is used in fertilizers and is found in sewage and wastes from humans and/or farm animals and generally gets into drinking water as a result of those activities. While excessive levels of nitrite in drinking water have not been observed, other sources of nitrite have caused serious illness and sometimes death in infants under six months of age. The serious illness in infants is caused because nitrite interferes with the oxygen-carrying capacity

of the child's blood. This is an acute disease in that symptoms can develop rapidly. However, in most cases, health deteriorates over a period of days. Symptoms include shortness of breath and blueness of the skin. Clearly, expert medical advice should be sought immediately if these symptoms occur. The purpose of this notice is to encourage parents and other responsible parties to provide infants with an alternate source for information concerning alternate sources of drinking water for infants. EPA has set the drinking water standard at 1 part per million (ppm) for nitrite to protect against the risk of these adverse effects. EPA has also set a drinking water standard for nitrate (converted to nitrite in humans) at 10 ppm and for the sum of nitrate and nitrite at 10 ppm. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to nitrite.

53. No change.
 54. No change.
 55. No change.
 56. No change.
 57. No change.
 58. No change.
 59. No change.
 60. No change.
 61. No change.
 62. No change.
 63. No change.
 64. No change.
 65. No change.
 66. No change.
 67. No change.
 68. No change.
 69. No change.
 70. No change.
 71. No change.
 72. No change.

Appendix B. Detection Limits

Detection shall be defined as greater than or equal to the following concentrations for each contaminant.

A. Inorganic Contaminants

Contaminant	Methodology	Detection Limit (mg/l)
Antimony	Atomic Absorption; Furnace	0.003
	Atomic Absorption; platform furnace	0.0008⁶
	ICP-Mass Spectrometry	0.0004
	Hydride-Atomic Absorption	0.001
Asbestos	Transmission Electron Microscopy	0.01 MFL ²
Barium	Atomic Absorption; furnace	0.002
	Atomic Absorption; direct aspiration	0.1
	Inductively Coupled Plasma	0.002 (0.001) ¹
Beryllium	Atomic Absorption; furnace	0.0002
	Atomic Absorption; platform furnace	0.00002⁶
	Inductively Coupled Plasma ³	0.0003
	ICP-Mass Spectrometry	0.0003
Cadmium	Atomic Absorption; furnace	0.0001
	Inductively Coupled Plasma	0.001 ¹
Chromium	Atomic Absorption; furnace	0.001

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	Inductively Coupled Plasma	0.007 (0.001) ¹
Copper	Atomic Absorption; furnace	0.001
	Atomic Absorption; direct aspiration	0.020
	Atomic Absorption; platform furnace	0.001
	Inductively coupled plasma	0.001
	Inductively coupled plasma; mass spectrometry	0.001
Cyanide	Distillation, spectrophotometric ⁴	0.02
	Distillation, automated, spectrophotometric ⁴	0.005
	Distillation, selective electrode ⁴	0.05
	Distillation, amenable, spectrophotometric ⁵	0.02
Lead	Atomic absorption; furnace	0.001
	Atomic absorption; platform furnace	0.001
	Inductively coupled plasma	0.001
	Inductively coupled plasma; mass spectrometry	0.001
Mercury	Manual Cold Vapor Technique	0.0002
	Automated Cold Vapor Technique	0.0002
Nickel	Atomic Absorption; furnace	0.001
	<u>Atomic Absorption; platform furnace</u>	0.0006 ⁶
	Inductively Coupled Plasma ³	0.005
	ICP-Mass Spectrometry	0.0005
Nitrate	Manual Cadmium Reduction	0.01
	Automated Hydrazine Reduction	0.01
	Automated Cadmium Reduction	0.05
	Ion Selective Electrode	1
	Ion Chromatography	0.01
Nitrite	Spectrophotometric	0.01
	Automated Cadmium Reduction	0.05
	Manual Cadmium Reduction	0.01
	Ion Chromatography	0.004
Selenium	Atomic Absorption; furnace	0.002
	Atomic Absorption; gaseous hydride	0.002
Thallium	Atomic Absorption; furnace	0.001
	<u>Atomic Absorption; platform furnace</u>	0.0007 ⁶
	ICP-Mass Spectrometry	0.0003

Footnotes:

- 1 Using concentration technique in Appendix A to EPA Method 200.7.
- 2 MFL = million fibers per liter > 10 mm.
- 3 Using a 2X preconcentration step as noted in Method 200.7. Lower MDLs may be achieved when using a 4X preconcentration.
- 4 Screening method for total cyanides.
- 5 Measures "free" cyanides.
- 6 Lower MDLs are reported using stabilized temperature graphite furnace atomic absorption.

B. Volatile Organic Chemicals

The detection limit for all volatile organic chemicals is 0.0005 mg/l.

C. Synthetic Organic Chemicals

Contaminant	Detection Limit (mg/l)
Alachlor	.0002
Atrazine	.0001
Benzo(a)pyrene	.00002
Carbofuran	.0009
Chlordane	.0002
2,4-D	.0001
Dalapon	.001
Dibromochloropropane (DBCP)	.00002
Di(2ethylhexyl)adipate	.0006
Di(2-ethylhexyl)phthalate	.0006
Dinoseb	.0002

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Dioxin	.000000005 (5 x 10 ⁻⁹)
Diquat	.0004
Endothall	.009
Endrin	.00001
Ethylene Dibromide	.00001
Glyphosphate	.006
Heptachlor	.00004
Heptachlor epoxide	.00002
Hexachlorobenzene	.0001
Hexachlorocyclopentadiene	.0001
Lindane	.00002
Methoxychlor	.0001
Oxamyl (vydate)	.002
Pentachlorophenol	.00004
Picloram	.0001
PCBs— as Aroclor (screening) [†]	
PCBs— as Decachlorobiphenyl	.0001
PCBs (as decachlorobiphenyl)	.0001
Simazine	.00007
Toxaphene	.001
2,4,5-TP (Silvex)	.0002

[†]PCBs may be screened using the Aroclor methods listed below:

Aroclor method	Detection limit (mg/l)
1016	0.00008
1221	0.02
1232	0.0005
1242	0.0003
1248	0.0001
1254	0.0001
1260	0.0002

- D. Radiochemicals.** The detection limit for monitoring radioactivity concentrations shall be that concentration which can be counted with a precision of plus or minus 100% at the 95% confidence level (1.96 σ where σ is the standard deviation of the net counting rate of the sample).
- To determine compliance with the maximum contaminant level for combined radium-226 and radium-228, the detection limit shall not exceed 1 pCi/L.
 - To determine compliance with the maximum contaminant level for gross alpha particle activity, the detection limit shall not exceed 3 pCi/L.
 - Detection limits for man-made beta particle and photon emitters are as follows:

Man made beta particle and photon emitters

	Detection Limit
a. Tritium	1,000 pCi/L.
b. Strontium-89	10 pCi/L.
c. Strontium-90	2 pCi/L.
d. Iodine-131	1 pCi/L.
e. Cesium-134	10 pCi/L.
f. Gross beta	1/10 of the applicable limit
g. Other radionuclides	1/10 of the applicable limit